

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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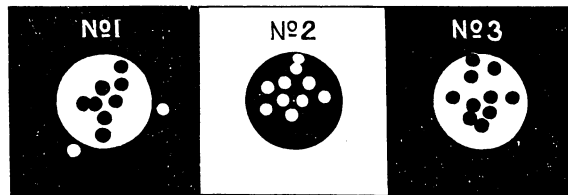
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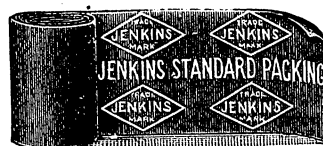
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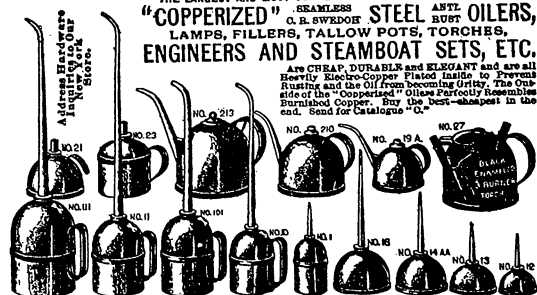
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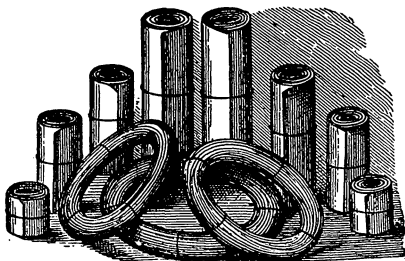
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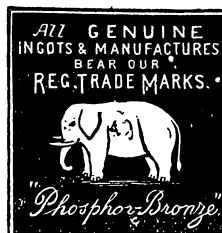
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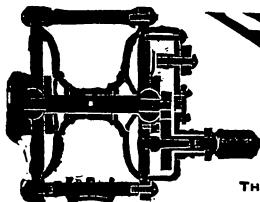
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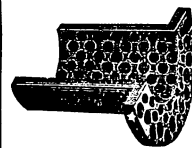
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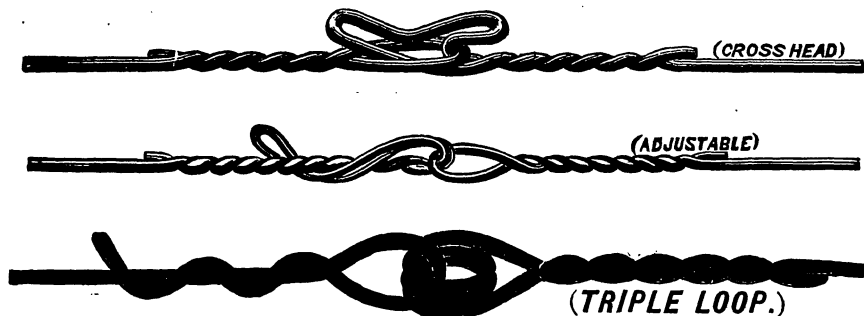
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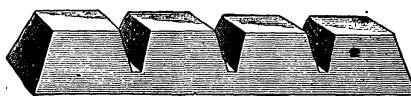
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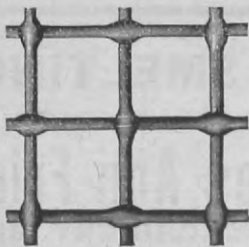
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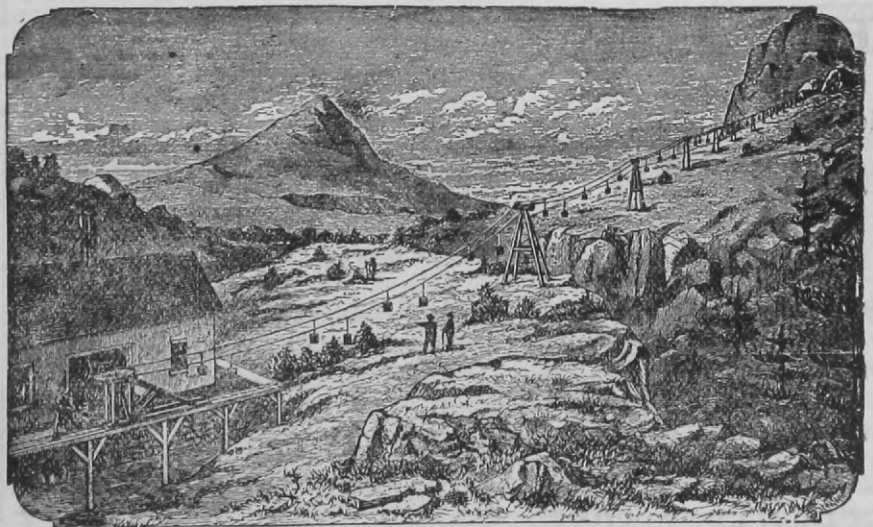
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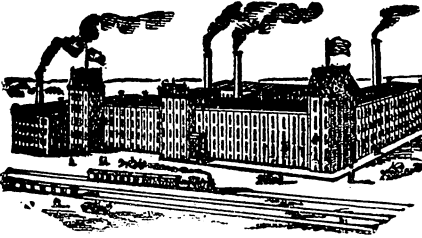
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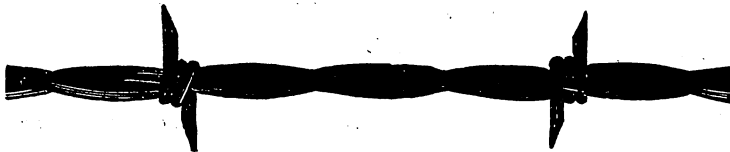
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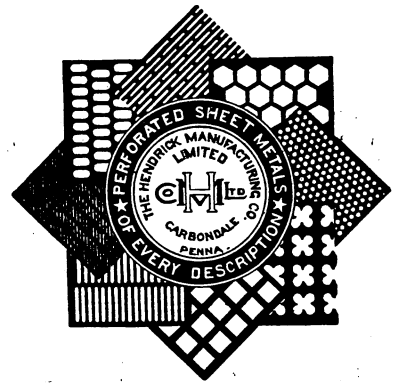
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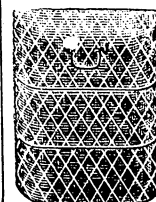
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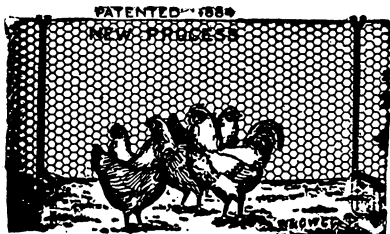
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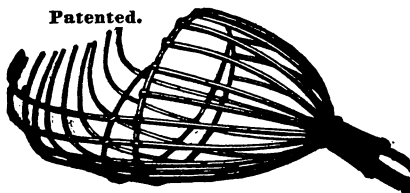
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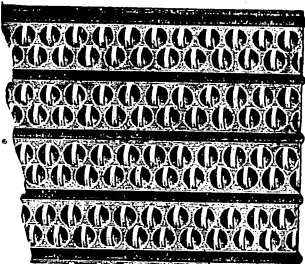
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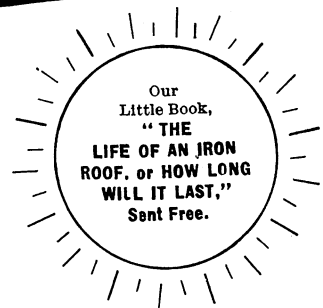
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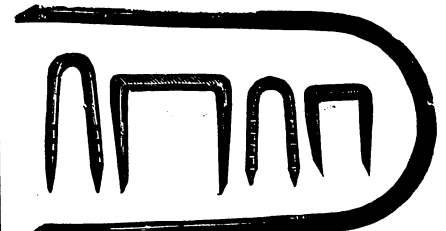
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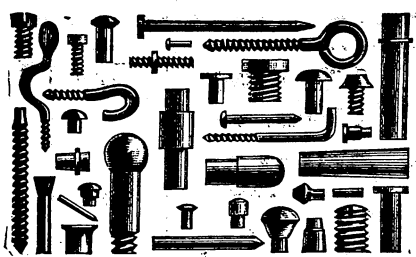
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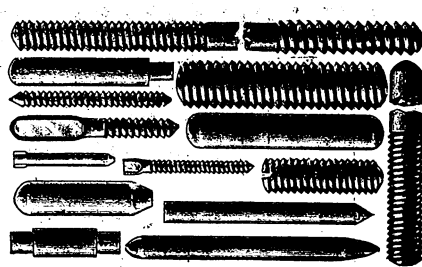
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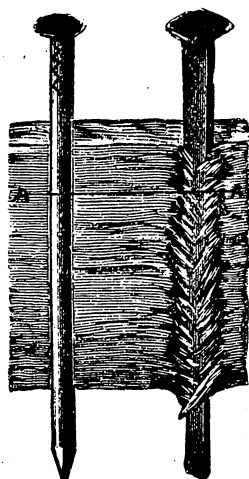


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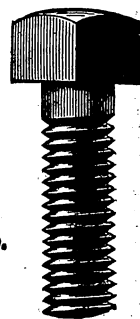
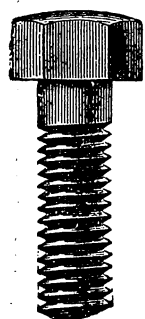
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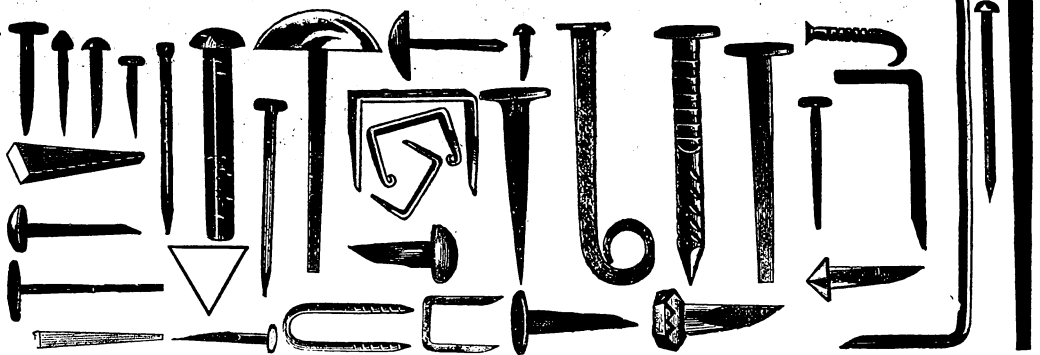
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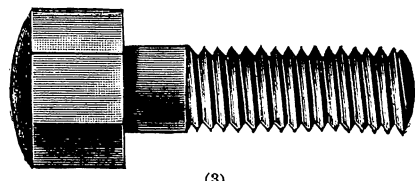


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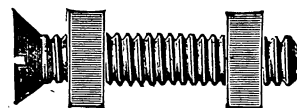
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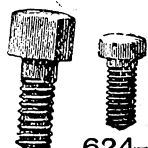
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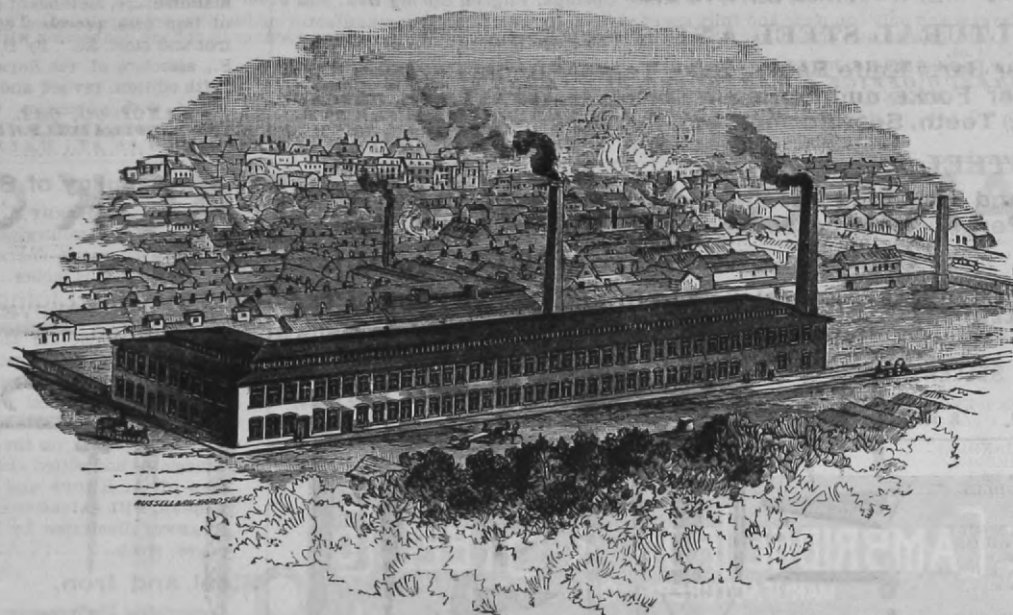
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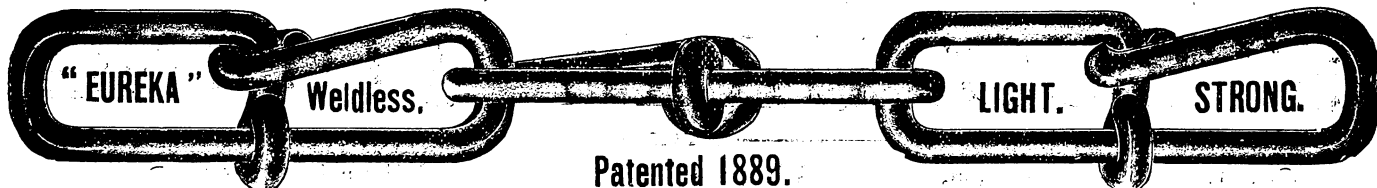
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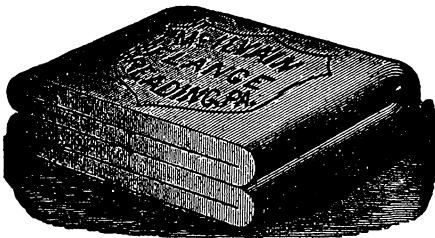
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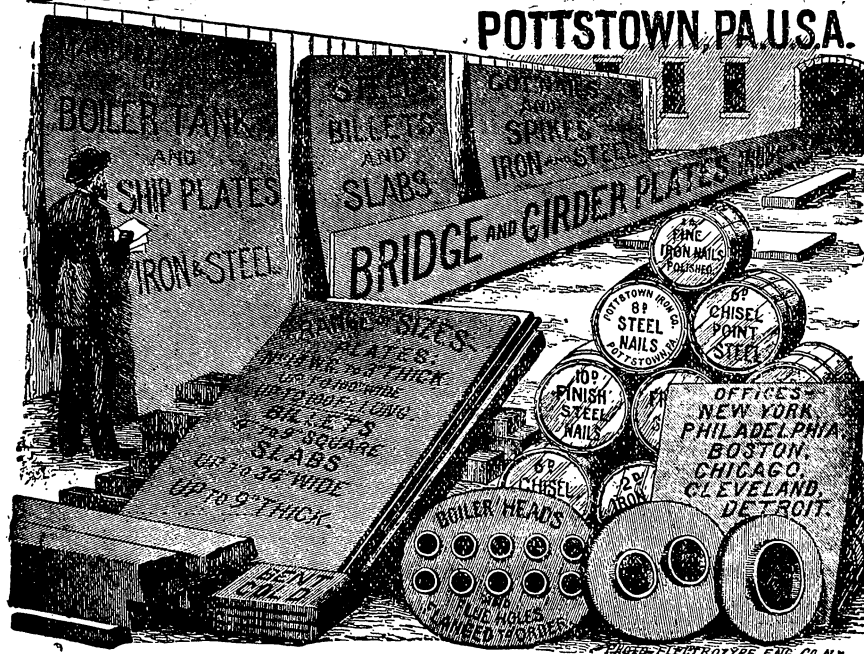
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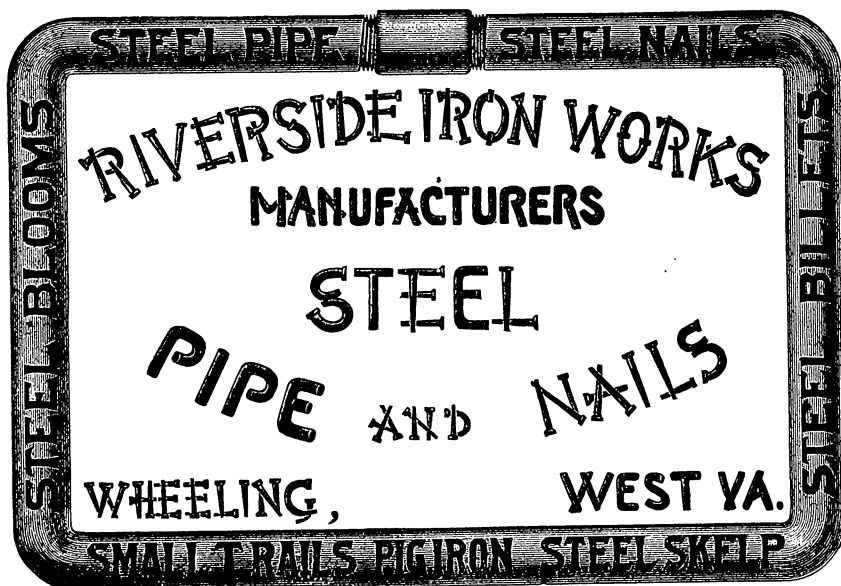
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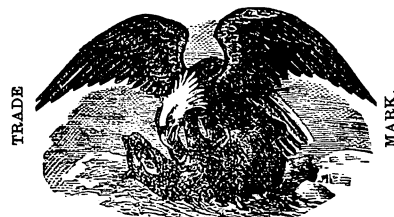
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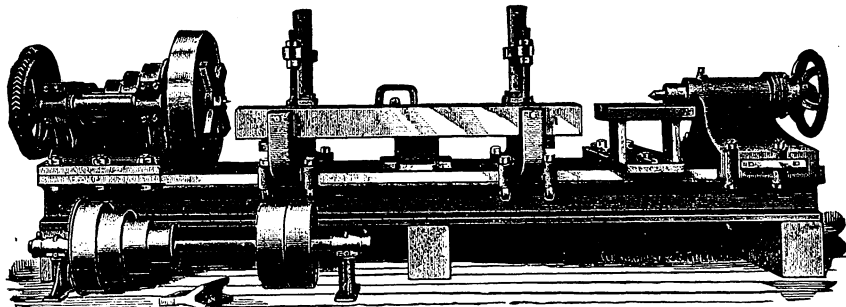
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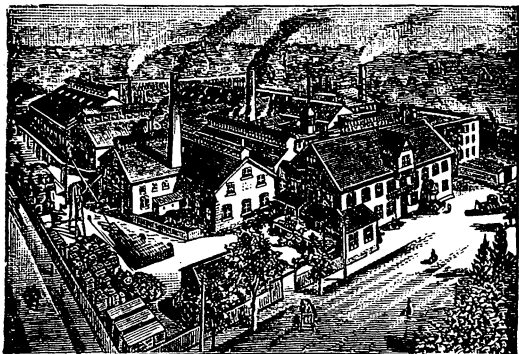
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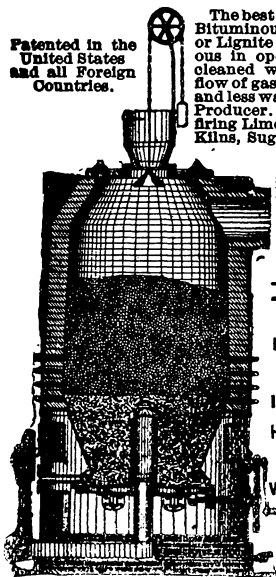
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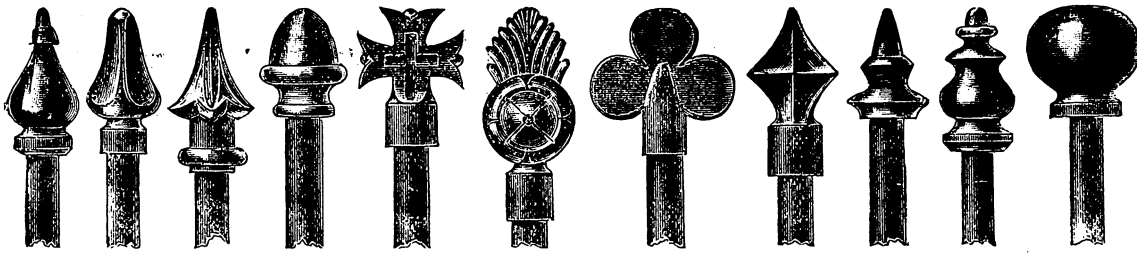
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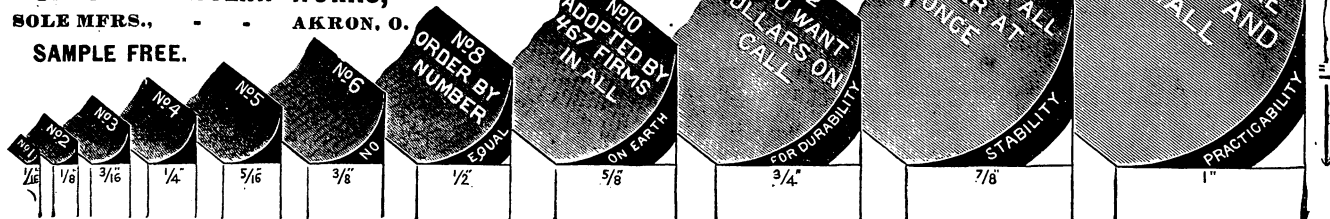
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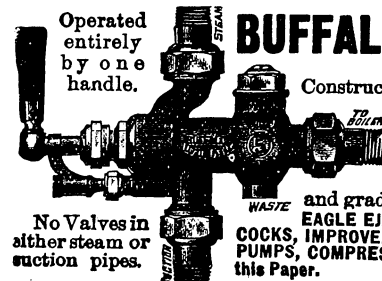


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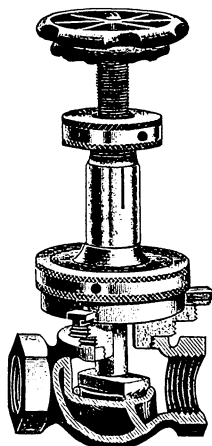
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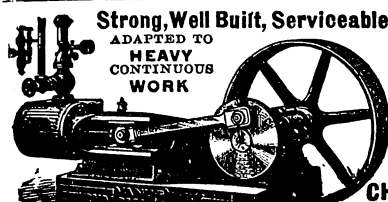
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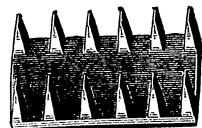
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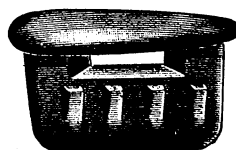
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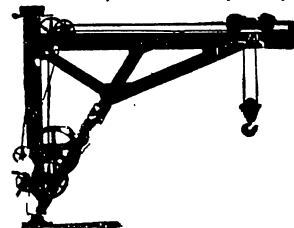
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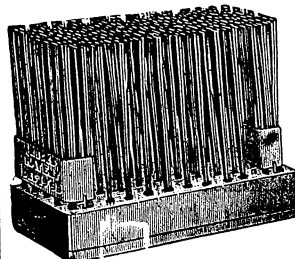
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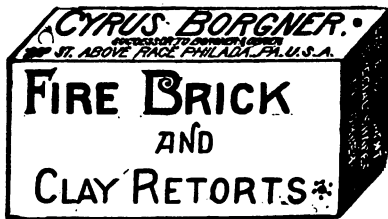
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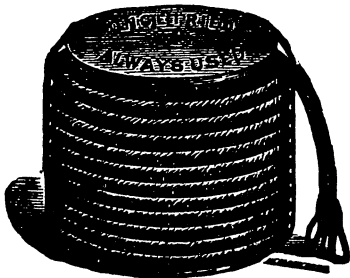
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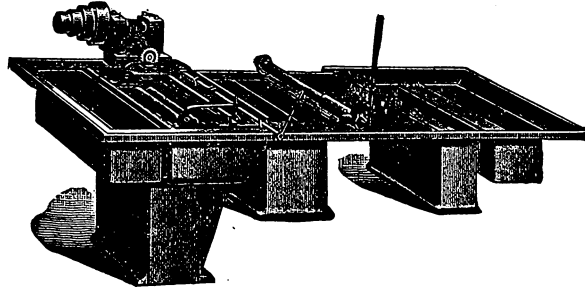
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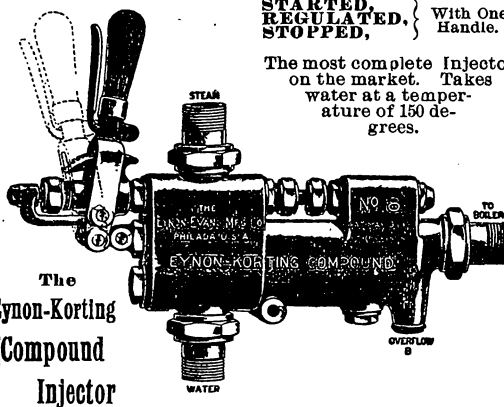
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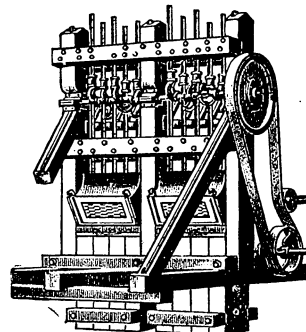
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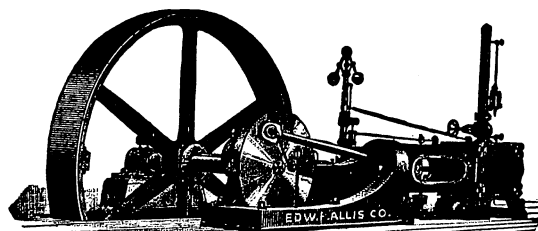
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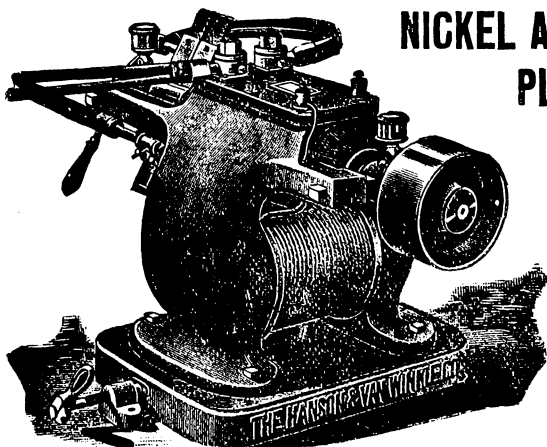
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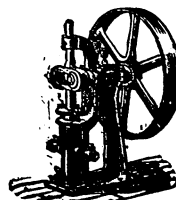


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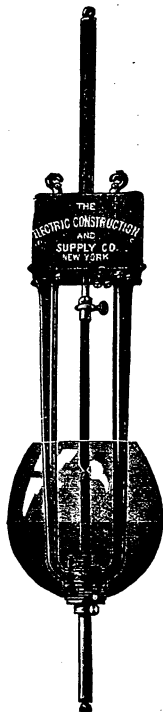
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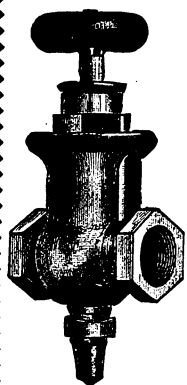
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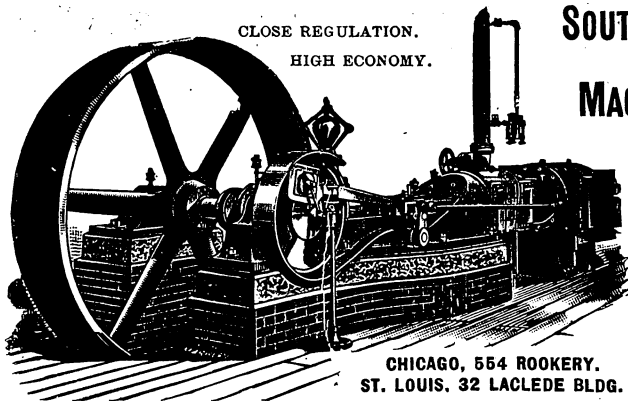
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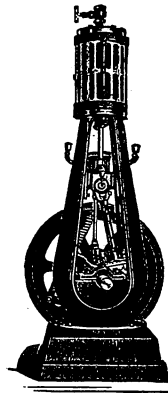
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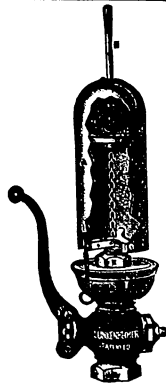
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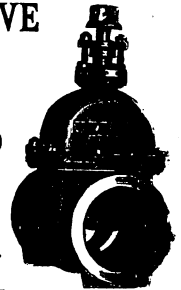
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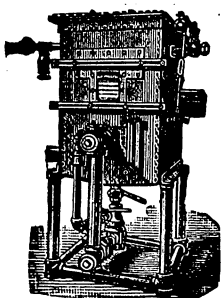
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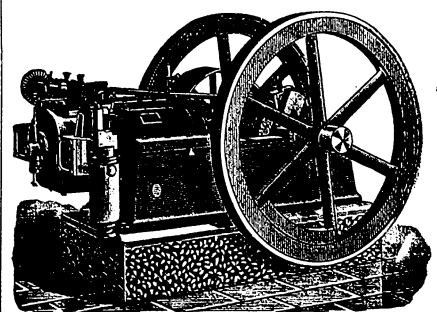
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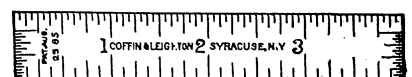
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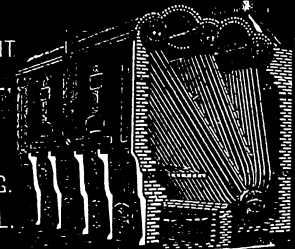
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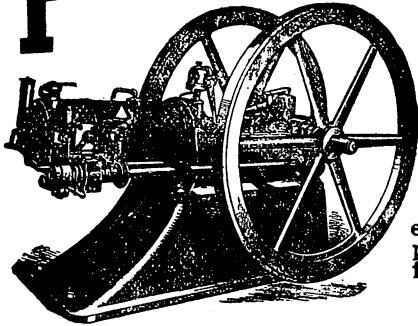
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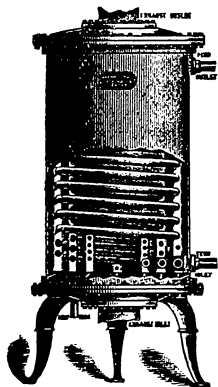
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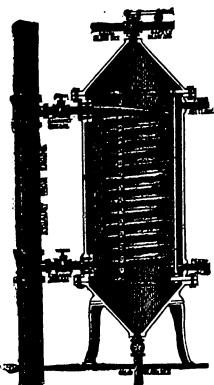


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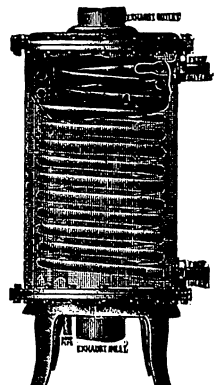
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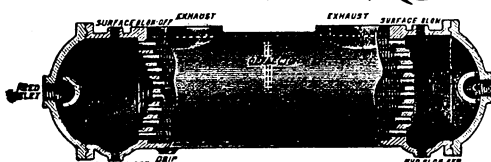
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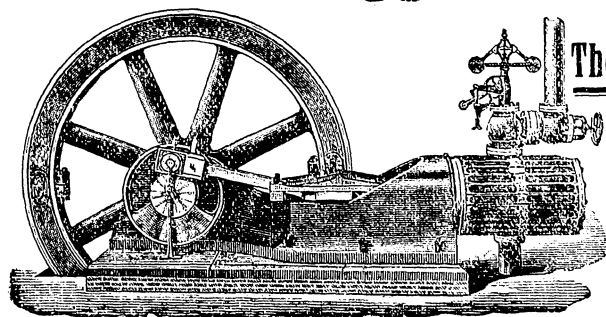
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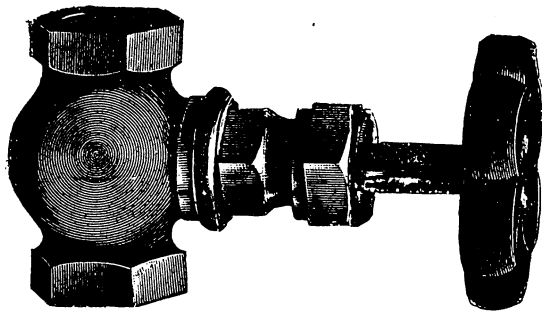
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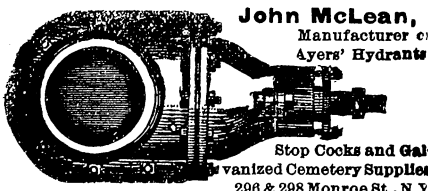
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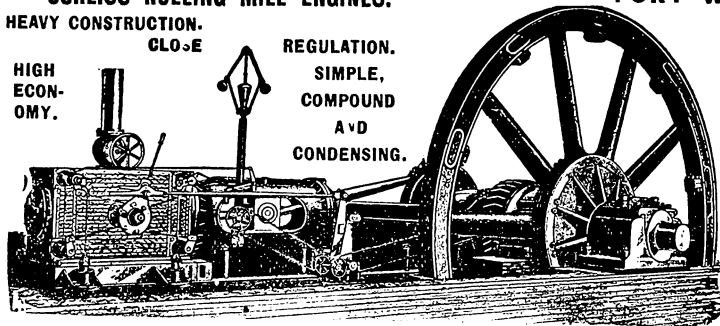
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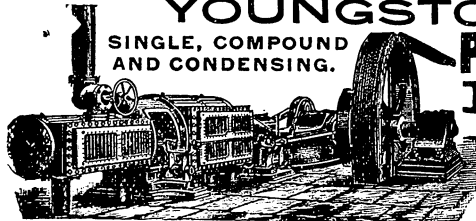
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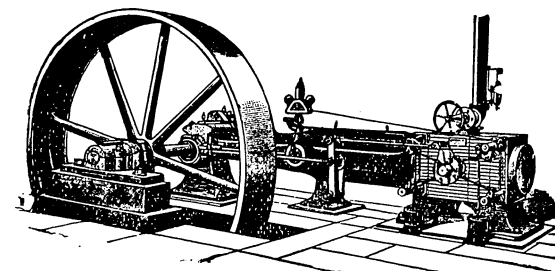
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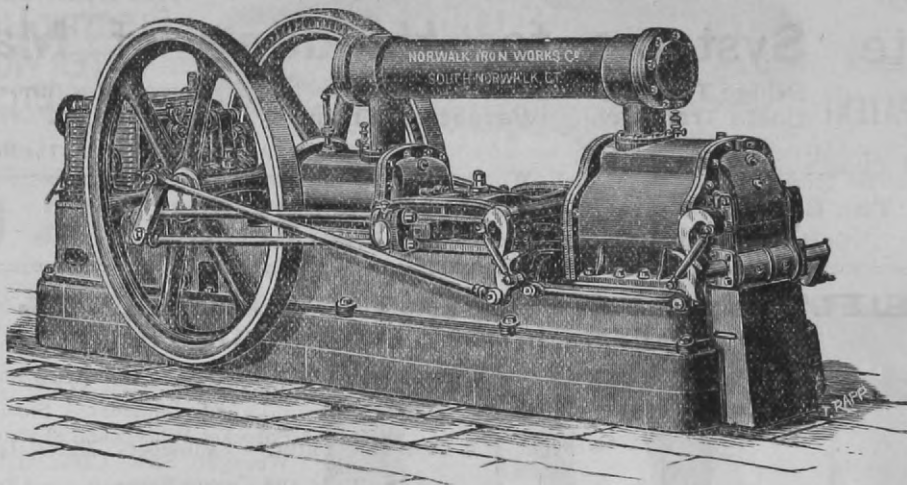


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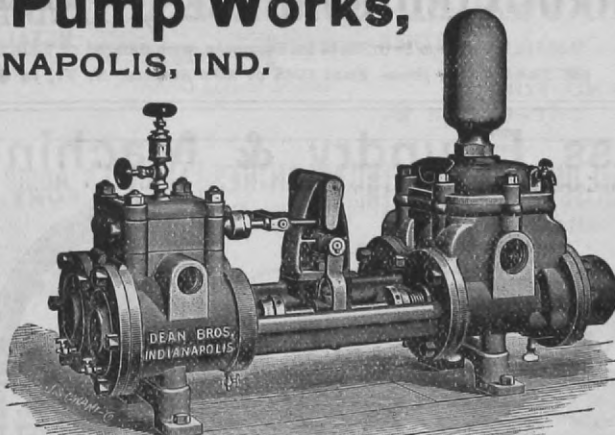
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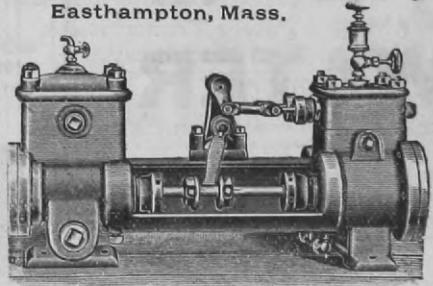


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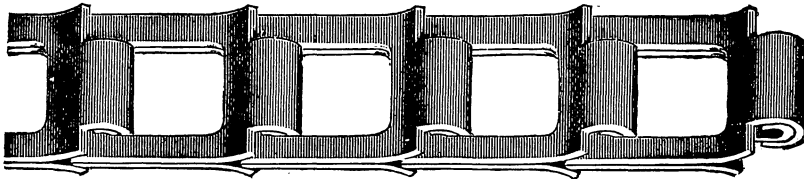
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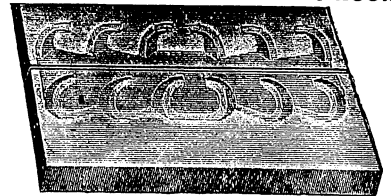
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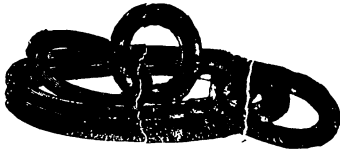
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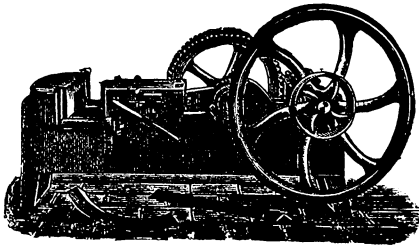
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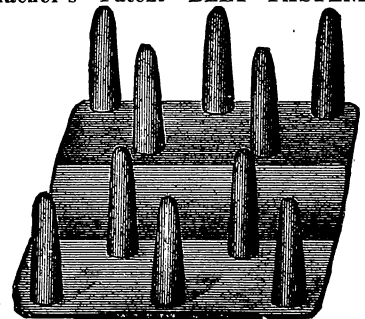
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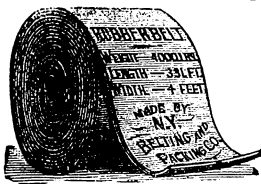
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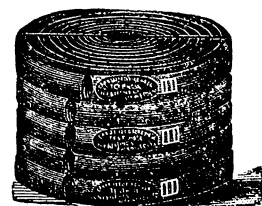


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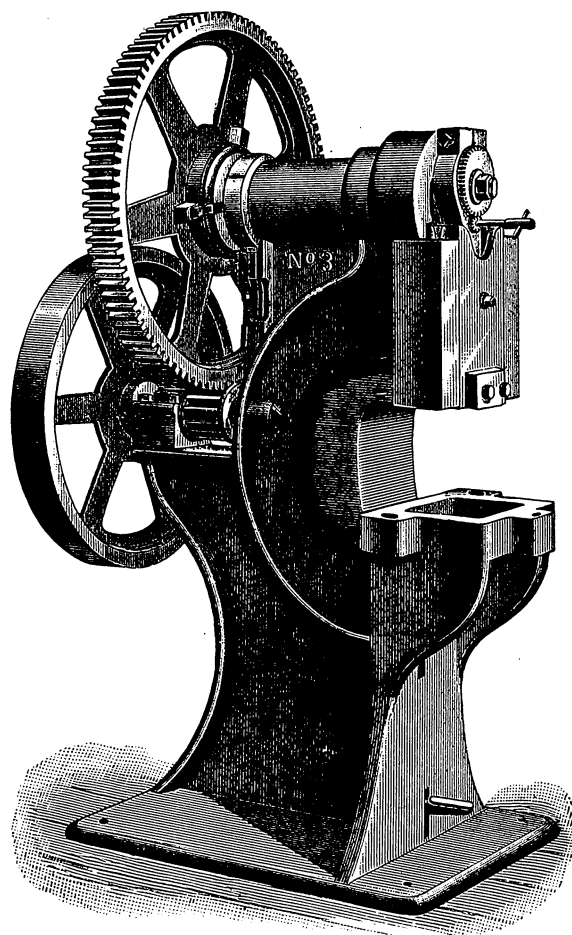
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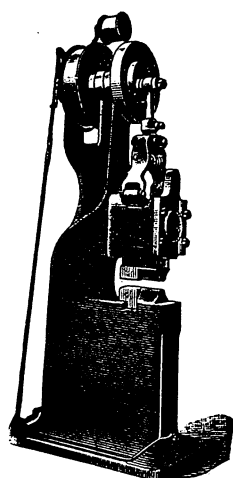
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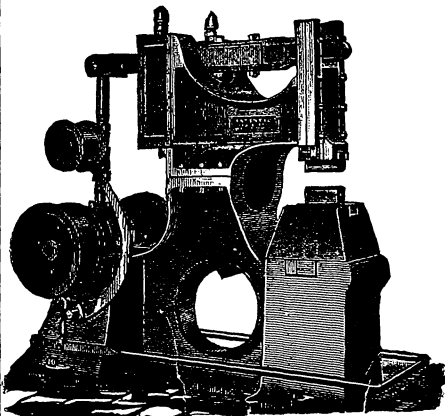
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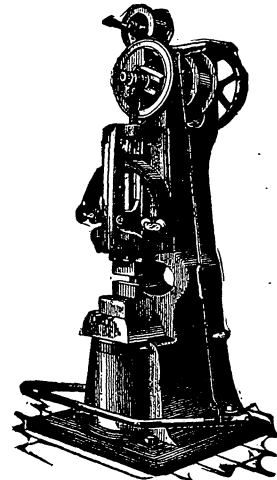
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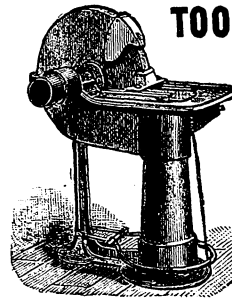
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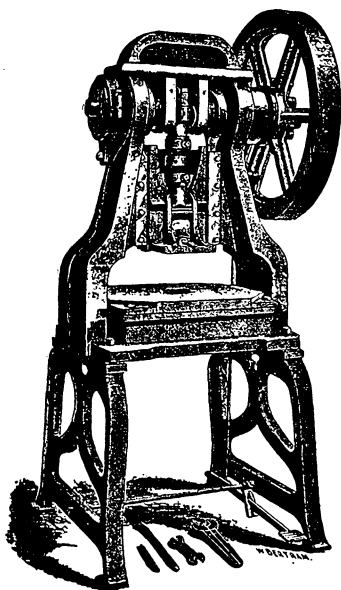
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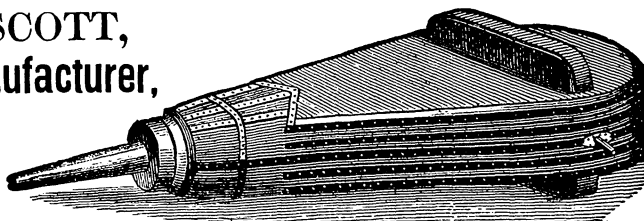
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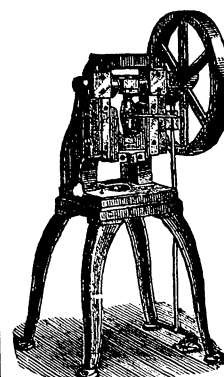
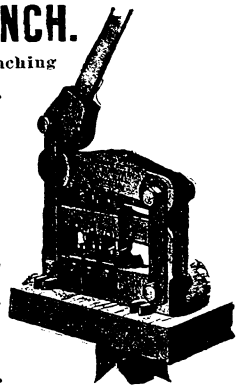
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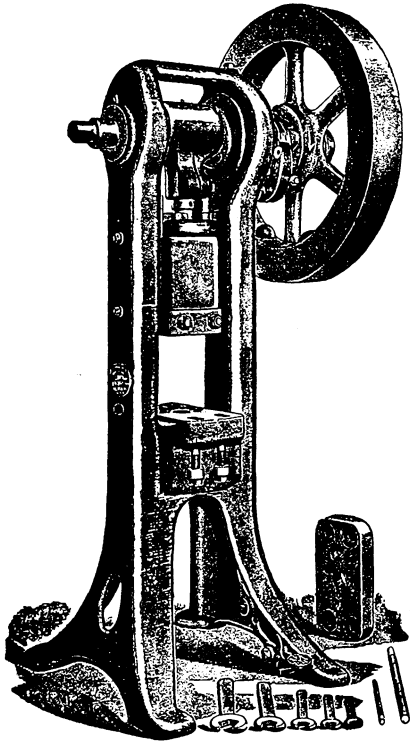
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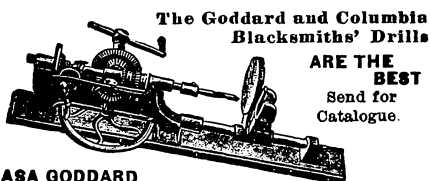
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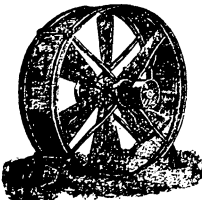


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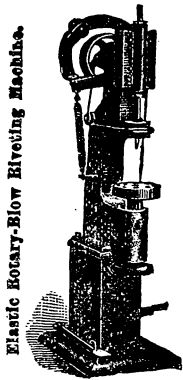
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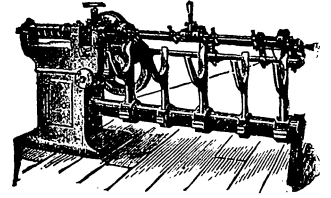
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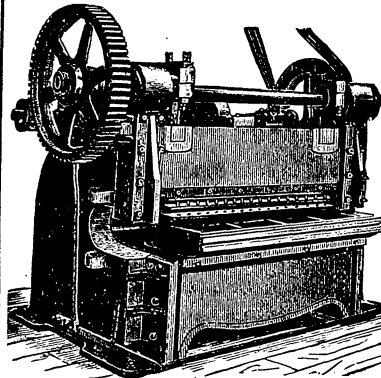
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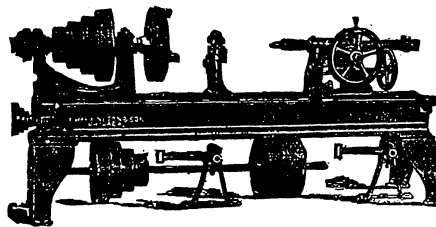
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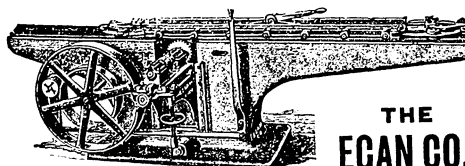
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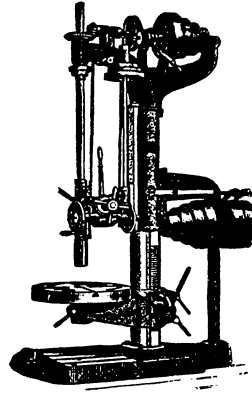
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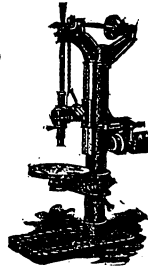
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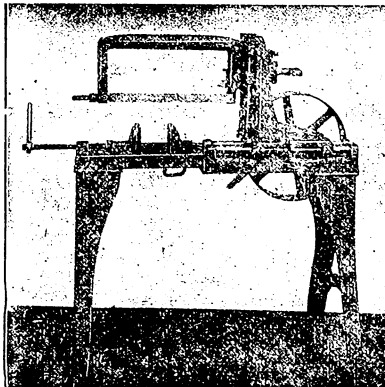
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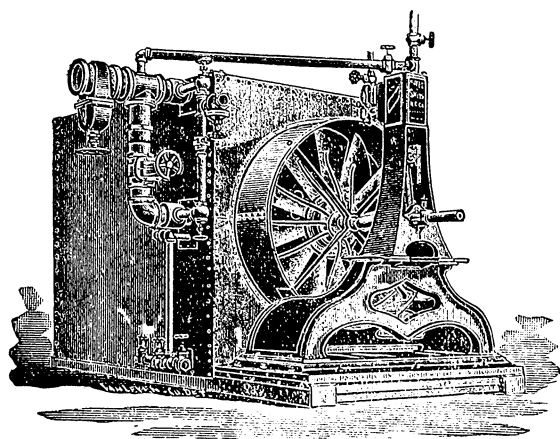
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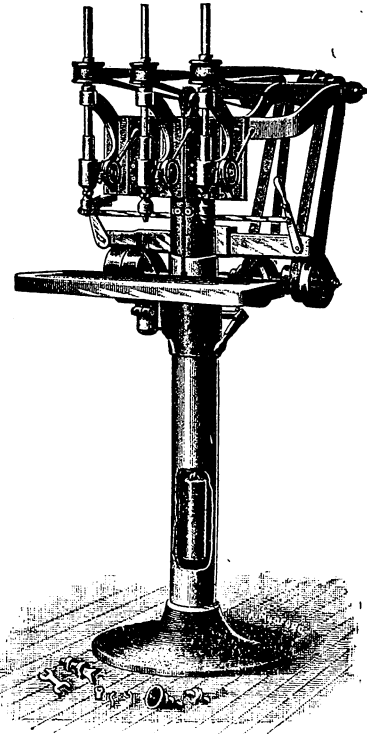
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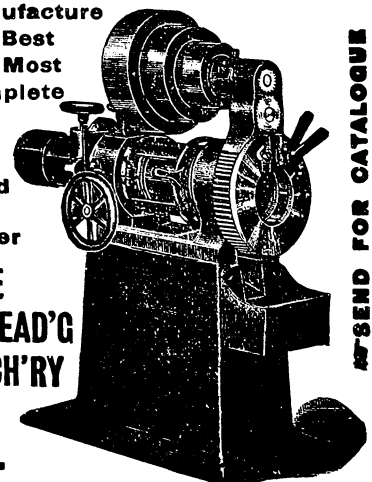
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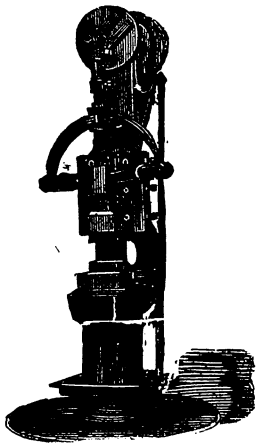
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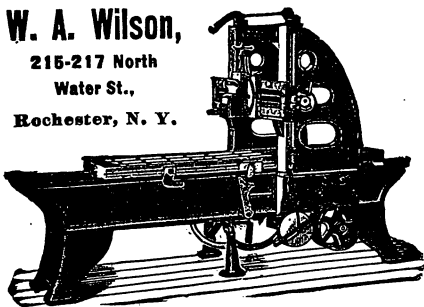
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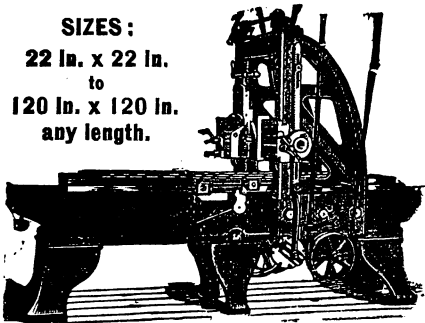
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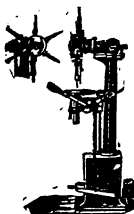
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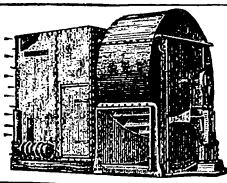
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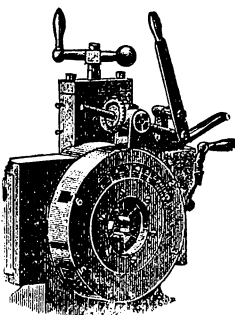
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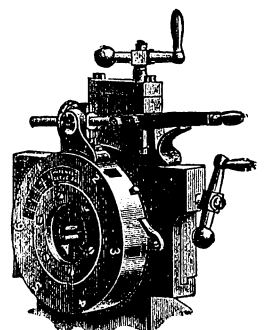
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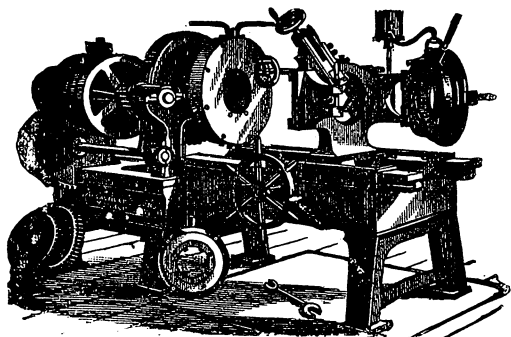
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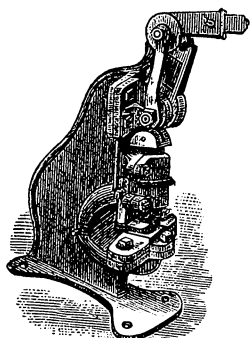
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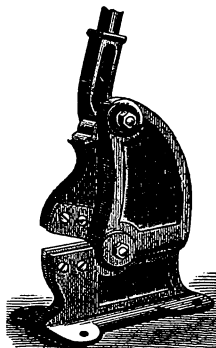


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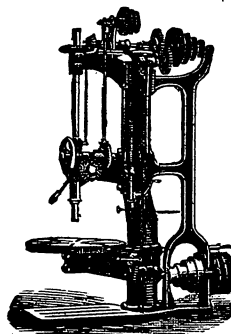


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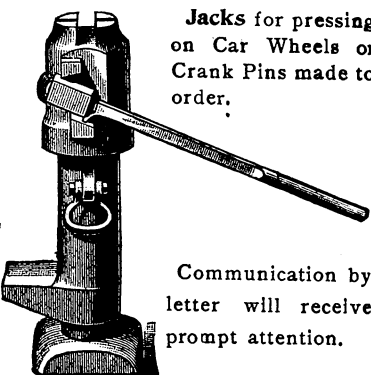
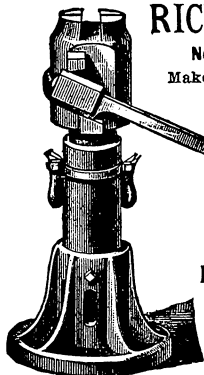
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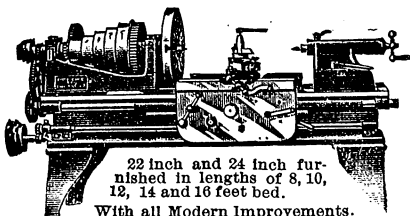
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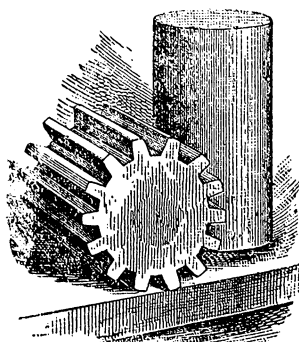
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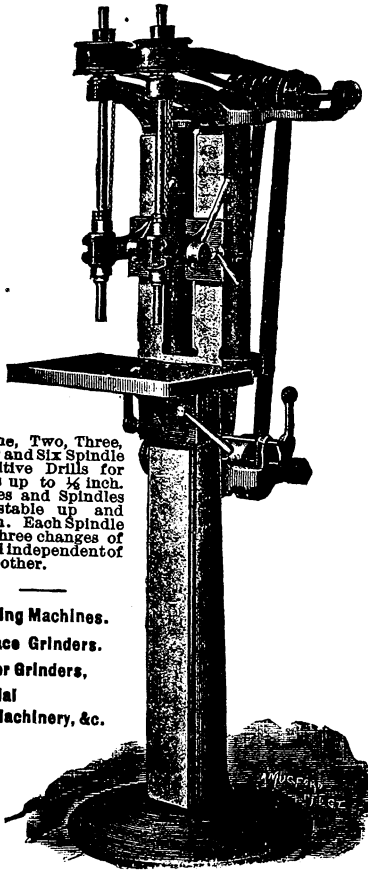
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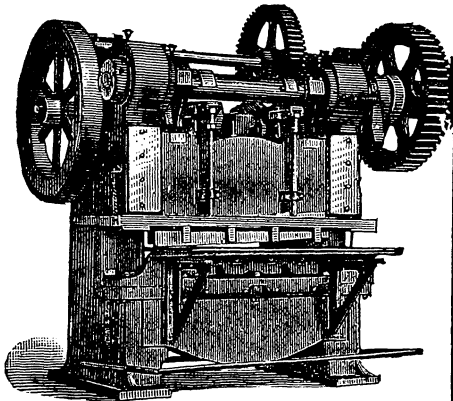
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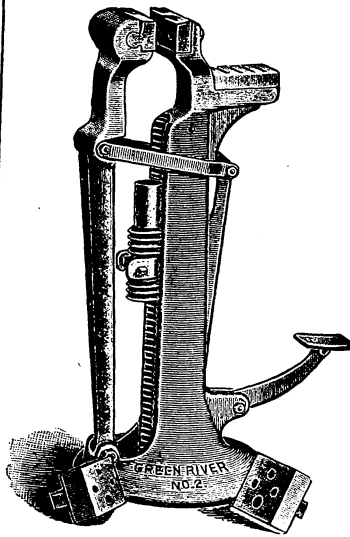
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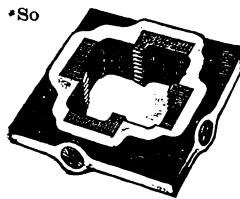
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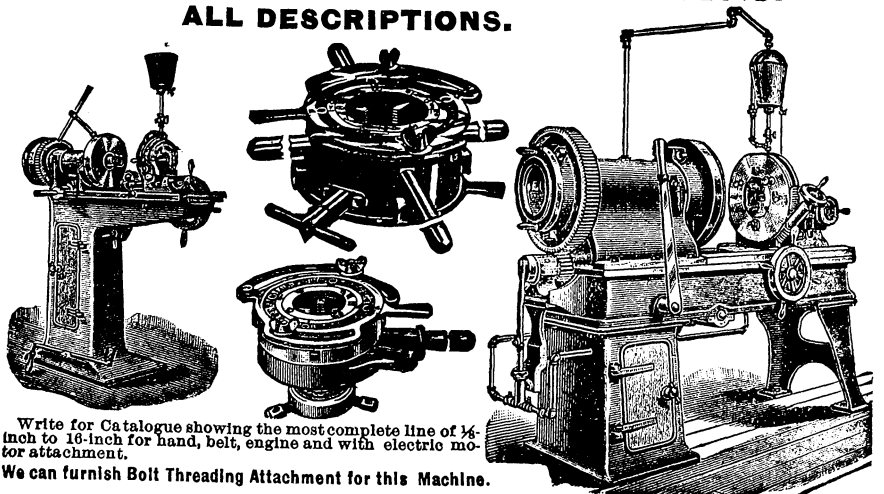
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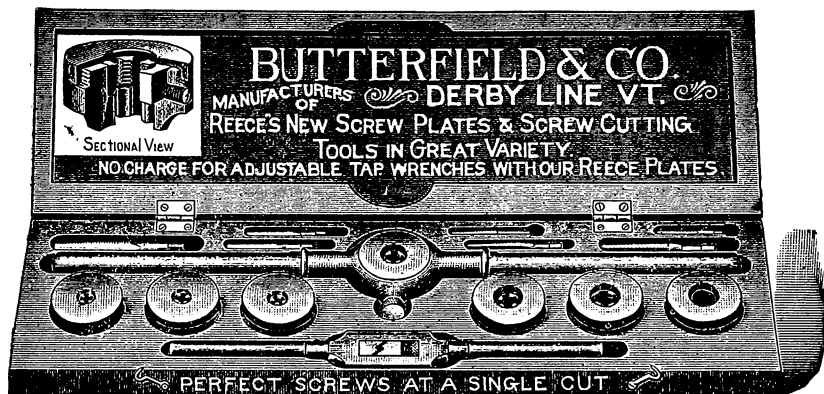
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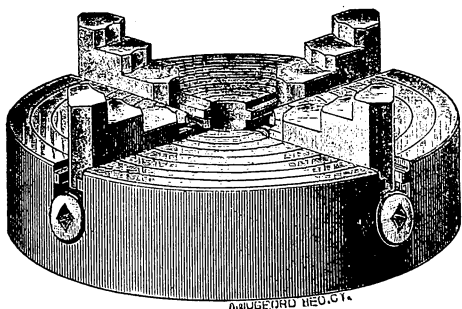
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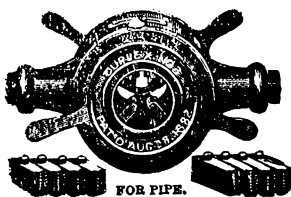
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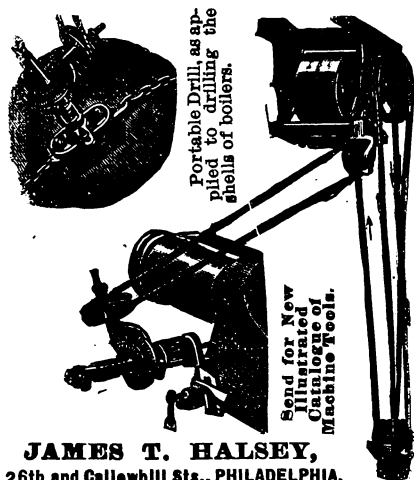
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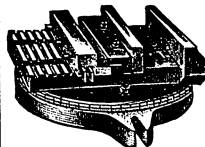
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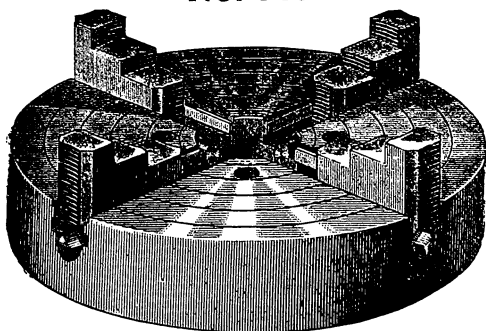
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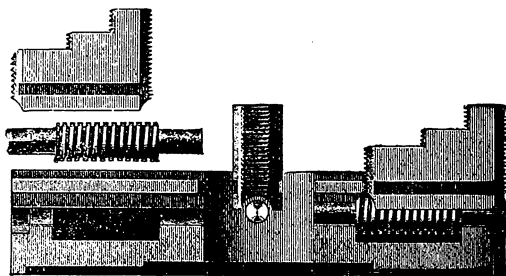
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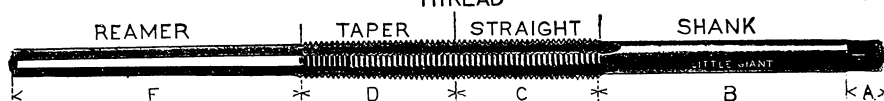
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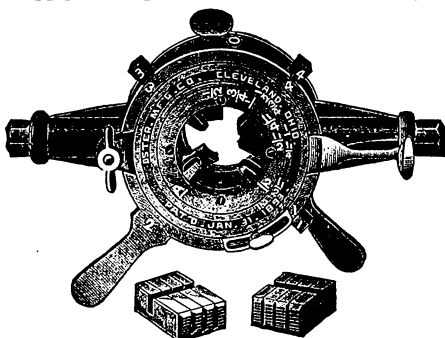
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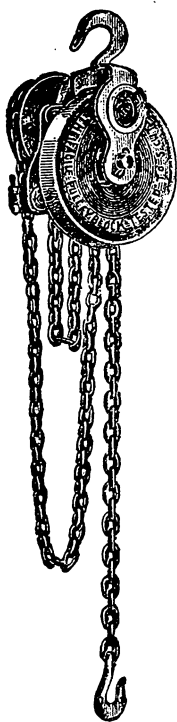
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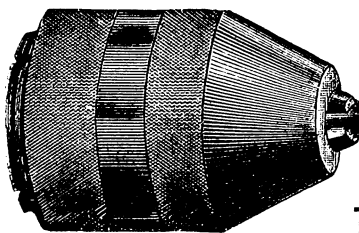
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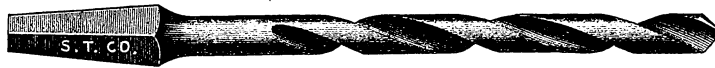
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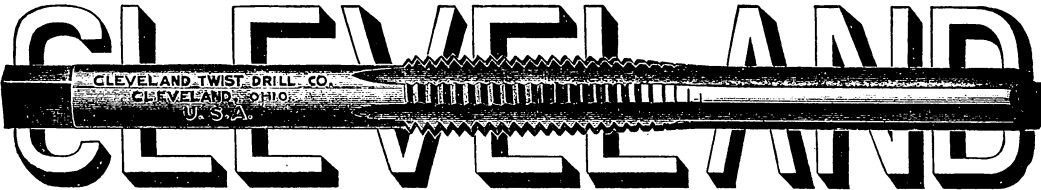
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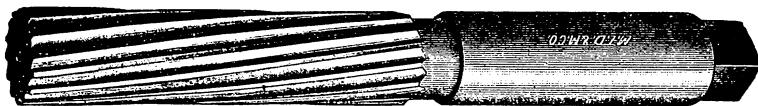
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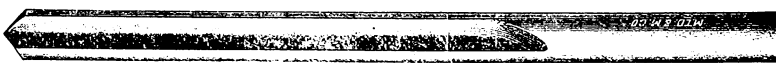
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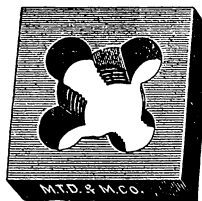
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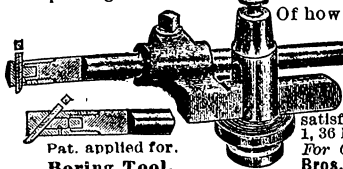
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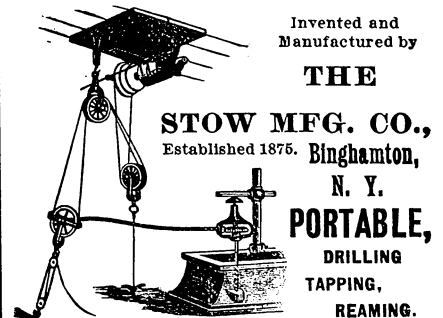
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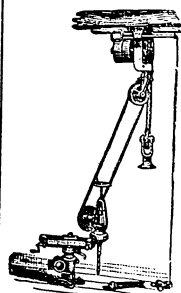
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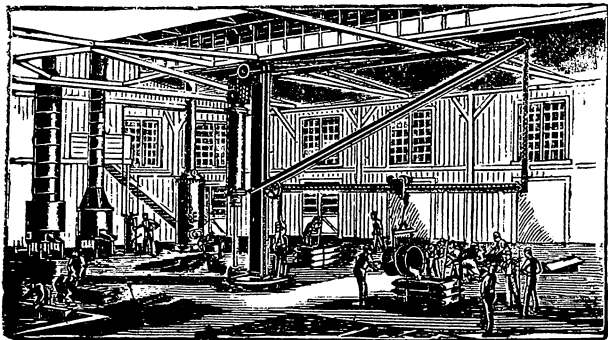
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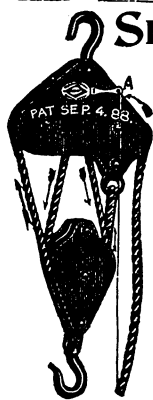
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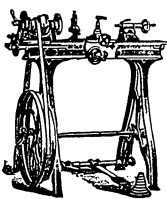
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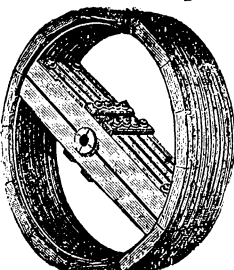
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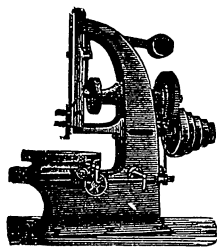
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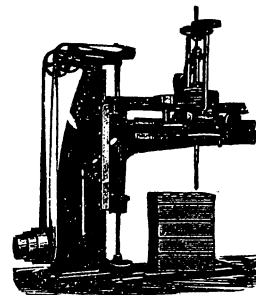


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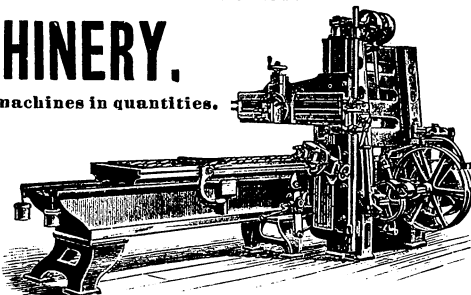
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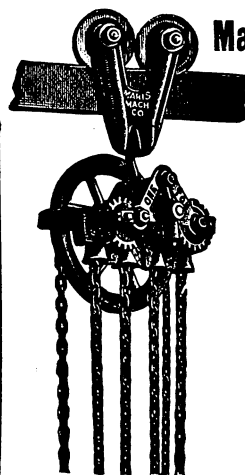
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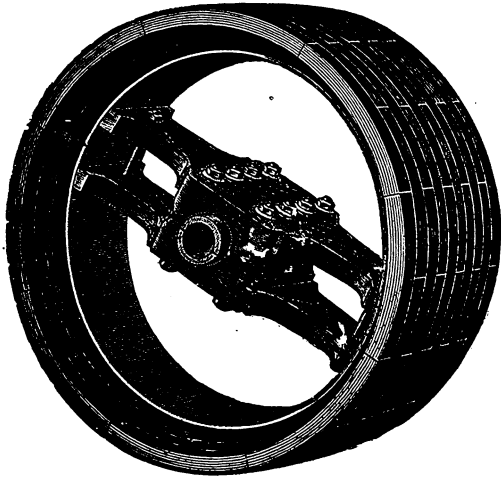
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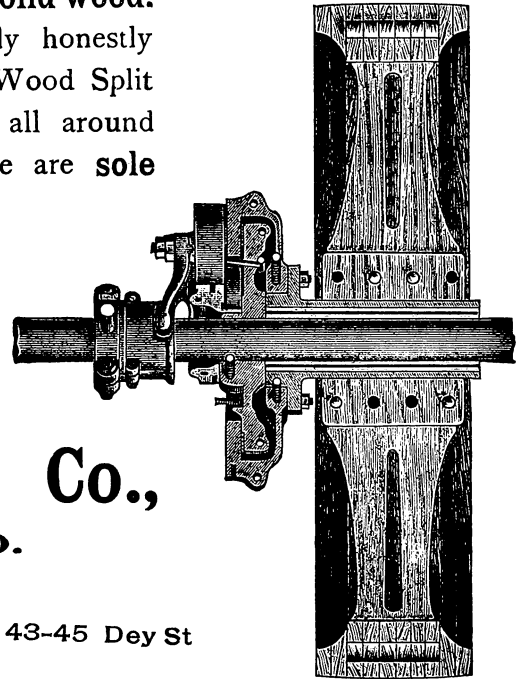
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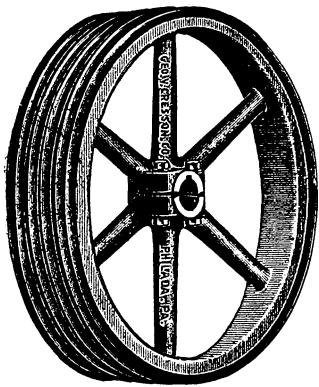
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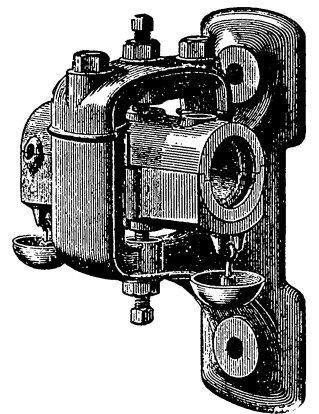
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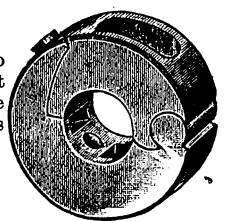
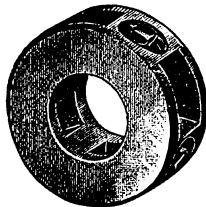
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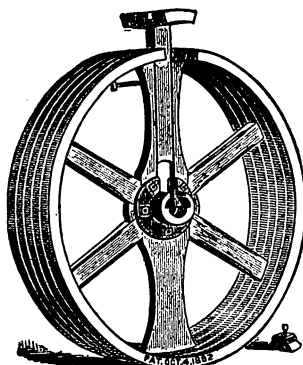
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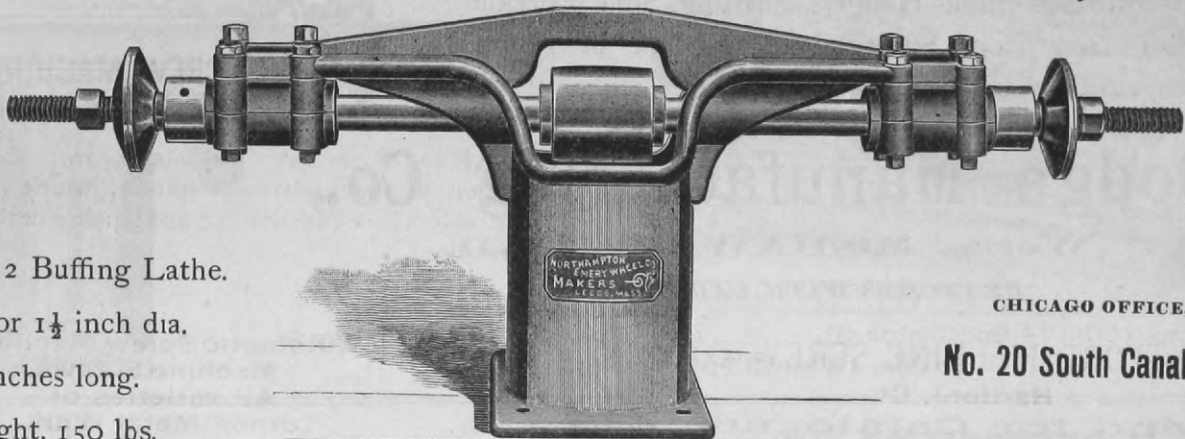


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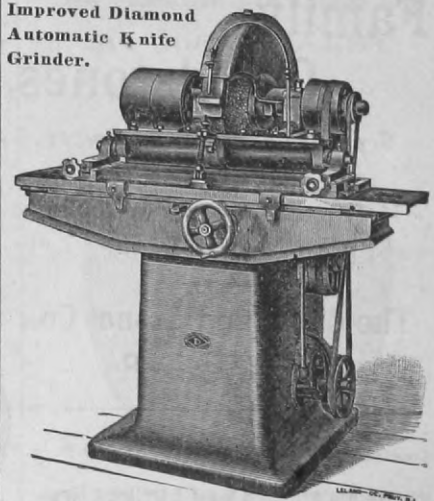
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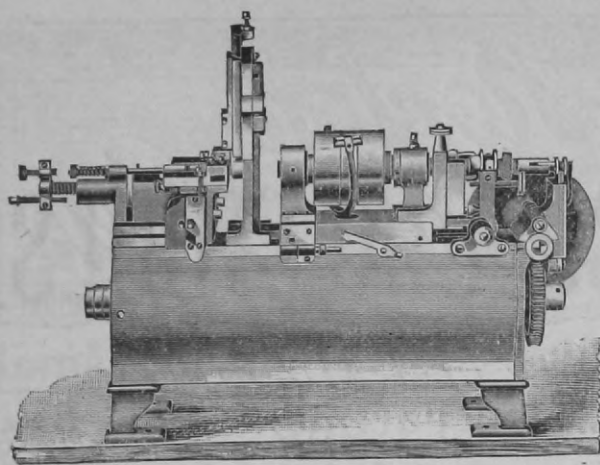


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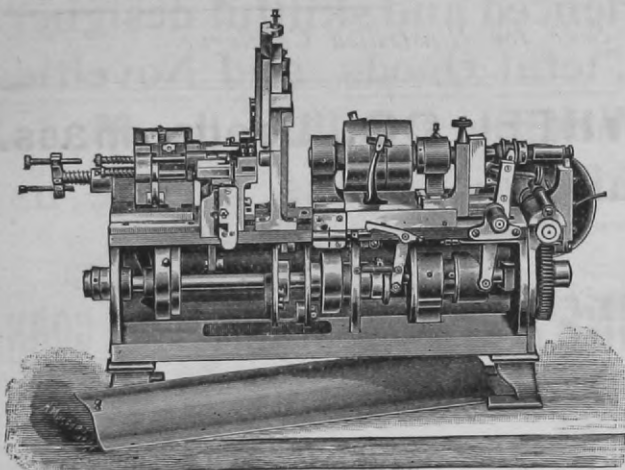
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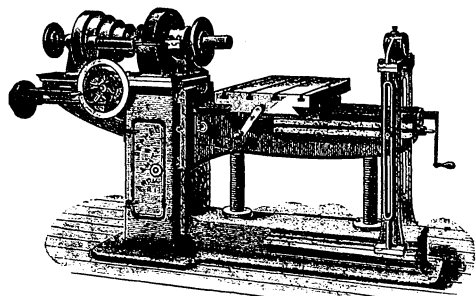
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1 80 in. Radial Drill Press. New.
1 28 in. New Haven Drill Press, Power Feed.
Second-hand.
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In use three months only.
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One 8 1/2 in. x 10 in. Armington & Sims Automatic Hor-
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16 in. x 16 in. x 12 in.
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nam Planer.
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36 in. x 34 in. x 16 1/2 ft.
L. W. Pond.
51 in. x 45 in. x 15 1/2 ft.
New Haven.

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6 in. Crank. Boynton &
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10 in. Post Drill, Auto.
Feed to Table for Butt
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1, 2 and 3 Spindle Sensitive,
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20, 24, 28, 30 and 44 in.
Drills.
60 in. Swing Post Drill.
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16 in. x 4 ft. Planer.
24 " 4, 5 and 6 ft. Planer.
28 " 5 and 8 " "
30 " 5, 8 and 10 " "
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72 " 25 " "
9, 12, 14, 24 and 26 in.
Stroke Shaper.
10 in. Stroke Slotter.
Hyd. Riveting Machine.
Crane, Both A1.
Punch and Shear.
Plate Planer.
11 in. x 5 ft. Eng. Lathe.
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15 " 6 and 5 ft. Engine
Lathe.
16 in. x 5, 6, 7 and 10 ft.
Engine Lathe.
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Lathe.
20 in. x 5, 6, 7, 8 and 10 ft.
Engine Lathe.
21 in. x 10 and 13 1/2 ft.
Engine Lathe.
24 in. x 10 ft. Eng. Lathe.
25 in. x 16 and 2 1/2 ft. Eng.
Lathe.
26 in. x 10 1/2 ft. Eng. Lathe.
32 " 16 " "
35 " 13 " "
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57 in. Double Head
Driving Wheel
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Special lot of NEW ENGINE LATHES

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Machine Tools, Special Prices;

Planer 29' x 27' x Planes 7'. Good. \$325.
" 24' x 24' " 6' New, hvy, mod'n 390.
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- 1 18 x 8 New Haven Lathe.
- 1 20 x 8 Porter Lathe.
- 1 20 x 10 Porter Lathe.
- 1 20 x 12 Blaisdell Lathe.
- 1 21 x 8 Lodge & Davis Lathe.
- 1 24 x 12 Lodge & Davis Lathe.
- 1 30 x 23 Sellers Lathe.

PLANERS.

- 1 22 x 22 x 4 Whitcomb Planer.
- 1 24 x 24 x 7 New Haven Planer.
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ENGINES, Horizontal and Vertical. All types and sizes up to 2000 H. P.

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CORLISS ENGINES, 36 in. dia. and under. PUMPS of all kinds and sizes.

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WE WANT TO BUY SCRAP,

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- 20 in. x 6 ft. Bullard.
- 24 in. x 12 ft. Geo. Gage.
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- 24 in. x 24 in. x 5 ft. Putnam.
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- 10 in. Juengst Crank.
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Also a large number of other machines. Write for complete list and detailed description.

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Numerous Engines, Boilers, Pumps, Tanks, Crushers, Compressors, Rock Drills, Hoisting Engines, &c., cheap.

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One Duplex Steam Pump, 1 1/2 in. suction, at \$30.

Lot Lathe Drip Pans at \$3.00 each.

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We have in stock about 1000 feet of best quality 2 1/4 in. four ply water hose, which we will sell at 35¢ per foot (price of 2 in.), with couplings, thread to suit regular 2 in. hose coupling, or to fit 2 in. wrought iron pipe. Address

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10 in., 11 in. and 13 in. Swing, 4 and 5 ft. Bed Lathes, Reed, Prentice and L. & M.
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1 17 in. x 17 in. x 30 in. Hand Planer.
 1 16 in. x 16 in. x 3 ft. Crank Planer.
 1 17 in. x 17 in. x 3 ft. L. & M. Planer.
 1 20 in. x 20 in. x 4 ft. L. & M. Planer.
 1 24 in. x 24 in. x 6 ft. Pease Planer.
 1 27 in. x 27 in. x 5 ft. White Planer.
 1 60 in. x 60 in. x 22 ft. Heavy Planer with 4 heads.
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 1 8 ft. Boring and Turning Mill with pulley attachment.

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2 20 in. Drill Presses, Prentice & Davis.
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 8 Slate Drills, 1 one-spindle, 2 two-spindle.
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 6 bench Drills.
 1 50 in. Heavy Geared Post Drill.
 1 each No. 2, 3 and 4 Garvin Gang Drills.

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15 in. Stroke, Smith.
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10 in., 12 in. and 14 in. Swing, 3, 4 and 5 ft. Beds, Garvin and Spencer.

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1000 tons 60 lb. Steel.	50 tons 35 lb. Iron.
150 " 60 lb. "	150 " 30 lb. "
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40 tons 40 lb. Iron.	Johnson Girder
250 " 40 lb. Steel	Rails.

27 different gauge second-hand locomotives.
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OLD RAILS AND SCRAP IRON

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20 in. x 8 ft. Pattern Lathe.

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 1 No. 2 Garvin Miller.
 1 No. 18 Garvin New Pattern Miller.
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 1 Brainard Universal Cutter Grinder.

SCREW MACHINES.

1 Plain 12 in. Monitor, 4 in. Chuck and cut-off Hand Turret.
 1 No. 2 Garvin Wire Feed Screw Machine.
 1 15 in. x 5 ft. Fox Lathe, square arbor.
 1 17 in. Fox Turret Lathe.

MISCELLANEOUS.

1 Wilder No. 3 Power Punch.
 2 No. 2 Power Punch.
 1 No. 3 Open Back Press.
 1 No. 3 Hand Shear for 1/4 in. iron.

1 Garvin Small Gear Cutter.
 3 Buffing Spindles.
 1 No. 1 Grinder & Emery Wheel.

1 Machinists' Forge.
 6 Bench Swivel Vises.
 1 Jewellers' Roll Machine.
 2 Fekdulum Foot Presses.

1 Small Riveting Machine.
 1 No. 2 Garvin Horizontal Tapper.

1 Iron Table, Metal Saw.
 2 Post Drills for Hand.
 2 No. 4 Emery Grinders.
 1 30 in. Stevens Pulley Lathe.

1 50 in. Niles Pulley Lathe.
 1 Tweddell Hydraulic Riveter and Hoist.
 1 50 in. Niles Pulley Borer.

1 Berry & Orton Cylinder Surface and Matcher

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Complete plant of machinery of the Hickory Wheel Co., at So. Framingham, Mass., for making bicycles. Run about a year only and as good as new, consisting of Flather and Pratt & Whitney engine lathes and screw machines, Brainard and Brown & Sharpe milling machines, Hendey and Whitcomb planers, Elliott and Prentice drills, polishing and grinding machines, special wood working machines for making wood rims.

Send for special circular B 31.

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156 Oliver St., Boston, Mass.

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15 ton and 20 ton 36 in. gauge Locomotives.

3 10 ton Standard gauge Shifters.

5 Upright Boilers 100 H. P. each.

37 Locomotive Boilers 15 to 200 H. P.

Various other style **Boilers, Engines, Pumps**, and an endless variety of machinery. Having our own **Machine Shop, Boiler Shop and Foundry**, can insure reliable articles.

CHESTER BERTOLETTE CO.,
 Norristown, Pa.

FOR SALE.

One 45 inch Buffalo Blower, 10-inch discharge, suitable for 38-inch cupola. Nearly new. Has always given the best of satisfaction. Price \$35. Address

THE ADAMS COMPANY,

Dubuque, Iowa.

FOR SALE.

Two Guild & Garrison Steam Pumps, 18 in. steam cylinders, 12 in. water cylinders, 24 in. stroke, strictly first-class. Capacity 600 gallons each per minute at ordinary speed.

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FOR SALE.

One No. 5 Root Blower, in use about two years. In perfect condition. Also one Cupola Shell, 72 inches in diameter, 45 feet high, 11 1/2 feet to bottom of charging door.

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 Menard, Ill.

Heavy Pressure PUMPS FOR SALE CHEAP.

Two pairs of

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Offers for sale at very low prices **BESSEMER STEEL WORKS; STRUCTURAL STEEL MILLS**, also **STEEL MILL FOR ROLLING BARS AND COLD ROLLING**, 2 **BLAST FURNACES**, **RUSTLESS IRON WORKS**, **GLASS WORKS**, **FOUNDRY**, **PLANING MILL**, **BRICK WORKS**, and numerous other manufacturing interests and large quantity of very desirable Coal Properties improved and unimproved.

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References on Application.

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A valuable United States patent. Can be manufactured at a small cost and sold for a good price to dealers in machinists' tools, hardware manufacturers, clock manufacturers, &c. Nothing of the kind on the market. Will be sold cheap and full particulars given.

P. J. CONROY,

Paschall, Phila.

Letters Patent No. 527,668,
 Oct. 16th, 1894.

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The Chicago, Milwaukee & St. Paul Railway Company owns and operates 6,150 miles (9,900 kilometers) of railway, exclusive of second track, connecting track or sidings. The eight States traversed by the company, Illinois, Wisconsin, Northern Michigan, Iowa, Missouri, Minnesota, South Dakota and North Dakota, possess, in addition to the advantages of raw material and proximity to markets, that which is the prime factor in the industrial success of a territory—a people who form one live and thriving community of business men, in whose midst it is safe and profitable to settle. Many towns on the line are prepared to treat very favorably with manufacturers who would locate in their vicinity.

Mines of coal, iron, copper, lead and zinc, forests of soft and hard wood, quarries, clays of all kinds, tan-bark, flax and other raw materials exist in its territory in addition to the vast agricultural resources.

A number of new factories have been induced to locate—largely through the instrumentality of this company—at towns on its lines. The central position of the States traversed by the Chicago, Milwaukee & St. Paul Railway makes it possible to command all the markets of the United States. The trend of manufacturing is Westward. Nothing should delay enterprising manufacturers from investigating. Confidential inquiries are treated as such. The information furnished a particular industry is reliable. Address

LUIS JACKSON,

Industrial Commissioner, C. M. & St. P. R'y,
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A Modern Rolling Mill

admirably adapted and situated for furnishing, at lowest cost of production, brass, copper and other metals, in sheets, rods and wire, are desirous of opening negotiations with some consumer and manufacturer of these goods who is anxious to extend his business and employ more capital. Address

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The old established Iron, Steel and Storage business conducted for thirty years or more by the late Albert T. Converse, in Norwich, Conn.

Since Mr. Converse's decease the business has been conducted by the Administrator at the old location, No. 23 Commerce St.

The property for sale consists of Warehouse containing store and three lofts, with wharf property, office and warehouse furniture and fixtures and stock of Iron and Steel.

The Real Estate, Fixtures and Furniture and stock of Iron and Steel will be sold all together at a low cash price, or, if not possible to do this, they may be sold separately.

Any one interested may obtain particulars by addressing S. T. HOLBROOK, Administrator, River Ave., or WILLIAM F. CONVERSE, 23 Commerce Street, Norwich, Conn.

FOR SALE.

About 4000 tons second-hand 58 lb. Steel T Rails. Fit to relay. Fastenings to match. Will divide the lot if necessary. Also several Locomotives and Passenger Coaches in good repair. Address

JUSTICE COX, JR., Iron and Steel,
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LUXURY ON WHEELS.

Solid through trains between Cincinnati, Toledo and Detroit. Pullman Vestibuled Trains between Cincinnati, Indianapolis and Chicago. Through car lines from Cincinnati via Indianapolis to St. Louis; also Cincinnati via Indianapolis to Decatur, Springfield, Ills., and Keokuk. These are the only lines running Pullman Vestibule and Dining Cars between the cities named. See that your ticket reads via Cincinnati, Hamilton and Dayton.

WM. M. GREENE, Gen'l Manager,
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TO LET FOR MANUFACTURING USES.

At South Easton, Pa., on line of Lehigh Valley Railroad and on Lehigh Canal. Sidings in buildings. Electric light. Electric street railway. One main 2-story building, 275 ft. x 45 ft. Steam Engine, Shafting and complete appurtenances for first-class factory or machine shop. One high 1-story building, 80 ft. x 45 ft., Cement floor. One 2-story building, 35 ft. x 45 ft., ground floor suitable for smith shop, etc.

These buildings were erected for galvanizing and barb wire plant, and more recently, for several years, have been in the occupancy of The National Switch & Signal Co. They form part of the plant of The Stewart Wire Co., being separated from its main plant by the Lehigh Canal. Affords a most desirable opportunity for industry using wire in any of its forms and is an exceptionally fine location for manufacturing of any character.

Will be let in whole or in part, with or without the adjacent thoroughly equipped and complete Wire Drawing Mill, steam and water power, situated on same side of Canal. For further particulars address

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A comfortable and convenient office, nicely carpeted, steam heat and gas, including desk and office furniture, on second floor, No. 2½ Murray St. Also floor space if desired. Cheap to the right party.

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One of the oldest established retail and wholesale Hardware, Stove and Plumbing businesses in Luzerne County. Situated at Wilkes-Barre in the heart of the richest coal field in America. Will sell stock reasonable and charge nothing for good will. Will either sell or give liberal lease on building, which is 25 by 104 ft., six stories high, on one of the most prominent business corners in the city. Our reason for selling is, our manufacturing business in another part of the city has grown to such proportions that we desire to devote our entire attention to same

W. B. BERTELS, SON & CO.,
186 East Market St.,
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To Manufacturers and Hardware Dealers.

FOR SALE.

A NOVELTY in a WEDGE for Axes and Tools with wood handles, in ten sizes. Patented, July 25th, '93. The only wedge on the market. If the handle shrinks the wedge can be driven deeper and the handle cut off flush and it will hold.

ALSO a new invention in SLIDING DOOR LATCHES, patented November 26, '89. These latches are for stable doors and gates. By turning other side up can be used as a straight gate or thumb latch. Can be made as cheap as ordinary latches.

The Wedge and Latches were ILLUSTRATED on pages 58 and 84 of *The Iron Age* of October 18th, 1894. Patents for sale or will take partner with small capital on six patents in the hardware line. Write for samples, etc.,

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Special Notice

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Scranton, Pa. Fine location. Good trade. Clean stock. Equipped for Tin work and Plumbing. Stock valued at \$4000 to \$5000. Reason for selling, owner's health failed. Address "F. M. S.," 1223 Washburn St., Scranton.

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Standard Scale and Fixtures Co.,

DEALERS IN AND JOBBERS OF

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Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

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Railroad, Packing House and Contractors' Supplies.

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A MAN competent to invent articles of mechanical hardware; one who has had experience and can show reference as to ability. Address "HARDWARE," office of *The Iron Age*, 220 So. 4th St., Philadelphia.

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A MAN to do enameling; one who thoroughly understands mixing, lining and firing. Address "ENAMEL," office of *The Iron Age*, 312 The Cuyahoga, Cleveland, O.

TRAVELING SALESMAN for special territory in every State, visiting the hardware and household goods trade, who will carry our aluminum goods as a side line. Address "MANUFACTURER," office of *The Iron Age*, 59 Dearborn St., Chicago.

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A YOUNG MAN with brains, at present buyer for wholesale hardware jobber, is open for engagement in the retail trade where an interest in the business will be exchanged for ability to buy at inside prices; correspondence solicited. "BUYER," No. 1115, care *The Iron Age*, P. O. Box 521, New York City.

A YOUNG MAN with four years' experience as salesman in city and on the road, familiar with the buyers of iron, steel and nails, desires position as New York representative of some house manufacturing iron or steel products; can furnish unquestionable references. Address "G.," No. 1115, care *The Iron Age*, P. O. Box 521, New York City.

FURNACE FIRE BRICK LAYER desires an engagement; competent and experienced in building and keeping in repair all kinds of furnaces and setting boilers; having 12 years' experience; age 34 years. For information address "BRICKLAYER," care *The Iron Age*, P. O. Box 521, New York City.

AN ENGLISHMAN returning to London desires to represent first-class American houses; well up in metal and machinery business; knows the English trade, also Australian, African and Indian shippers in England. Address "ENGLAND," care *The Iron Age*, P. O. Box 521, New York City.

AN EXPERIENCED, capable and responsible business man desires to represent in Chicago, on a commission basis, manufacturers of hardware specialties or regular hardware; advertiser is well acquainted and is a natural salesman; unqualified references will be furnished. Address "OFFICE NO. 1," 173 Randolph St., Chicago, Ill.

A MECHANICAL ENGINEER with long and varied experience as superintendent desires position; is accustomed to office work, estimating and contracting, or would represent a responsible firm in New York; specialties, sugar house and plantation machinery, home and foreign; large circle of acquaintances; first-class references. Address "PRACTICAL," Box 1115, care *The Iron Age*, P. O. Box 521, New York City.

ACTIVE TRADE DEVELOPER, (American, 38), with 20 years' experience as a salesman and manager of a large wholesale business in this city, personally acquainted with the leading jobbers and retailers of Hardware, Stoves, Tin, &c., throughout the Middle and Eastern States, is open for an engagement from January 1st, as manager of a branch house, or to fill similar position. Not adverse to representing a good house on a commission basis. A1 credentials as to ability, integrity, &c. "TRADE PROMOTER," care *The Iron Age*, P. O. Box 521, New York City.

EXPERIENCED hardware and cutlery man desires a position as salesman or house position; has had seven years' road experience and can furnish A1 references. Address "EXPERIENCE," P. O. Box 182, Baltimore, Md.

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SUPERINTENDENT OR CHIEF ENGINEER, by mechanical engineer of large and varied experience in hydraulic machinery, structural work in iron and steel, installation of plants, transmission of power, cranes, etc.; thoroughly conversant with modern methods of construction and shop practice. "MODERN METHODS," office of *The Iron Age*, 96-102 Reade St., N. Y.

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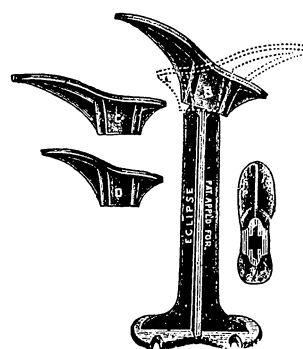
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Eclipse Shoe Stands and Lasts.

Reversible and Common Shoe Lasts.

Lap Lasts, Shoe Rests, &c., &c.

Patented May 1st, 1894.

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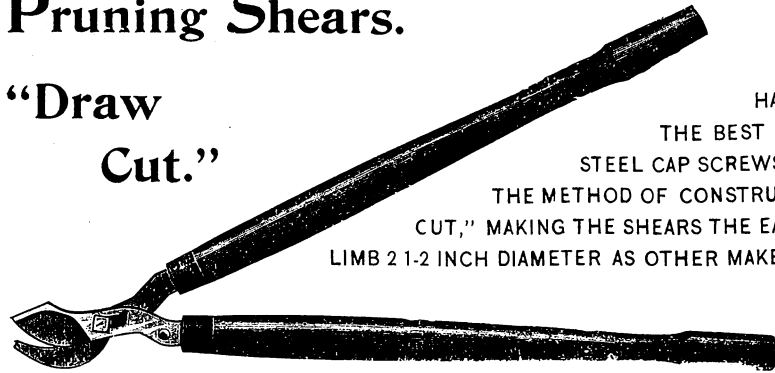
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The "Clyde"

Pruning Shears.

"Draw
Cut."



MADE IN TWO SIZES, No. 1 HAVING 25 INCH HANDLES, THE No. 2 (LIGHT WEIGHT) HAVING 22 INCH HANDLES. THESE SHEARS ARE HAND FORGED FROM THE BEST SHEAR STEEL, FITTED WITH NORWAY RIVETS AND STEEL CAP SCREWS.

THE METHOD OF CONSTRUCTION IS SUCH AS TO PROVIDE A POSITIVE "DRAW CUT," MAKING THE SHEARS THE EASIEST OPERATING UPON THE MARKET; WILL CUT A LIMB 2 1-2 INCH DIAMETER AS OTHER MAKES WILL A LIMB ONLY 1-2 INCH IN DIAMETER.

Ask Your Jobber for the "Clyde" or write direct to

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The Art of Coppersmithing.

A Practical Treatise on Working Sheet Copper into all Forms.

BY JOHN FULLER, SR.

CLOTH BOUND, 10 x 7 INCHES, 327 PAGES, 474 ENGRAVINGS.

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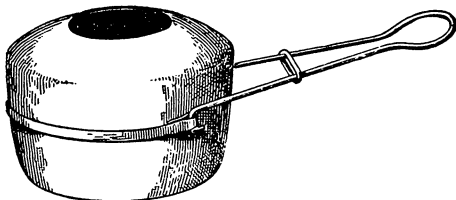


Fig. 108.—Clamp for Holding Tea Kettle while Being Tinned.

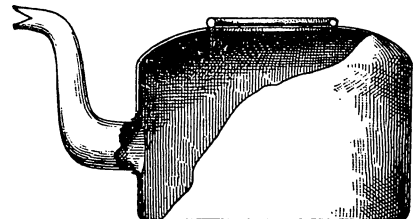


Fig. 110.—Tea-Kettle, Showing Spout Attached.

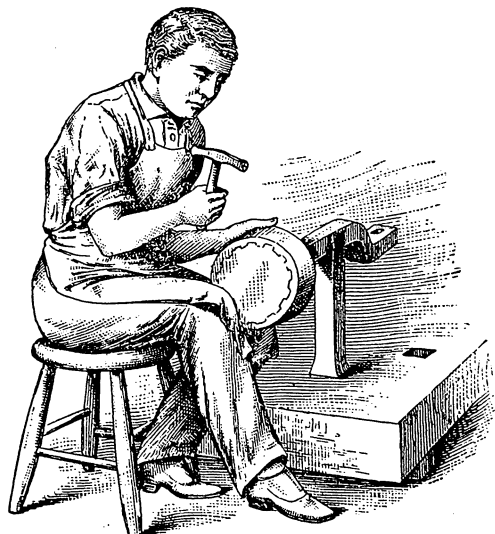


Fig. 107.—Planishing Tea-Kettle Side.

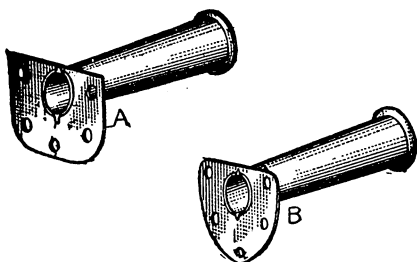


Fig. 54.—Way to Put the Flaps On.

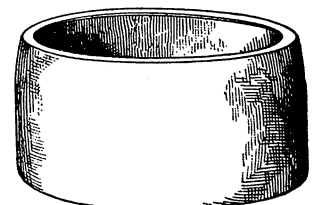
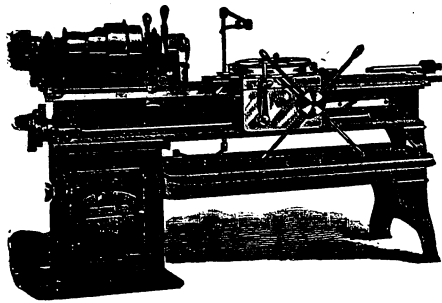


Fig. 105.—Putting in Bottom.

The above are Specimen Illustrations from "The Art of Coppersmithing," and indicate the Practical Nature of the Treatise, and how it Goes into All the Details of Workmanship.

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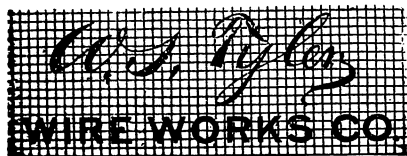
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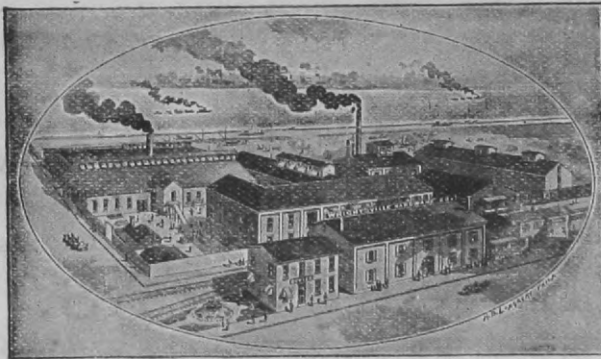
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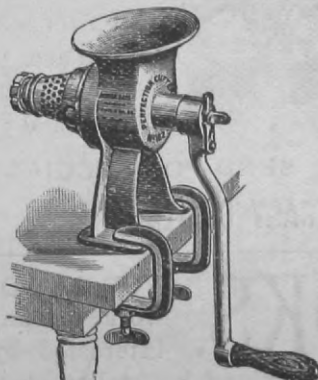
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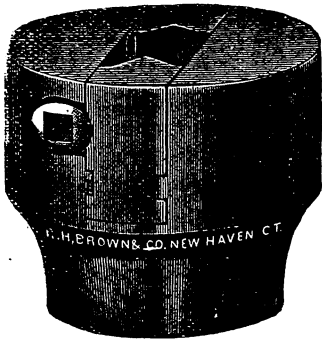
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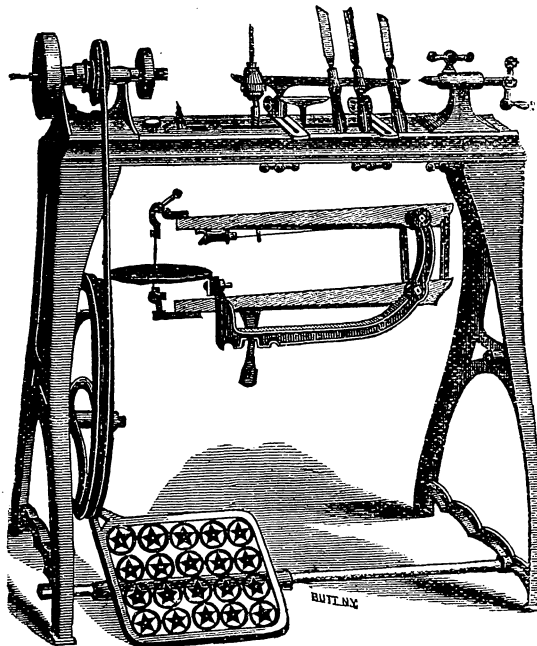
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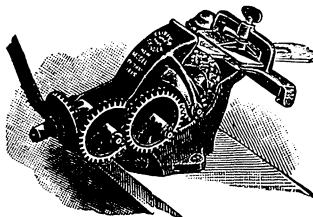
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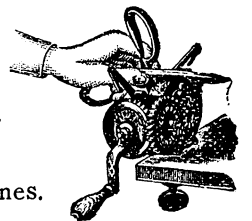


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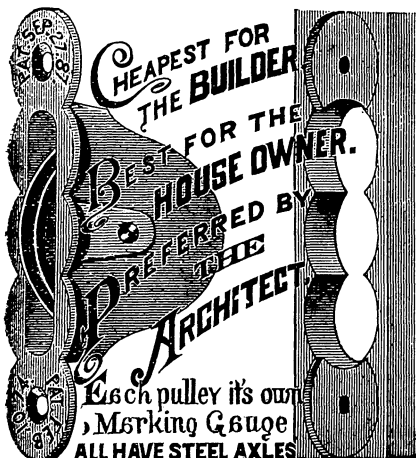


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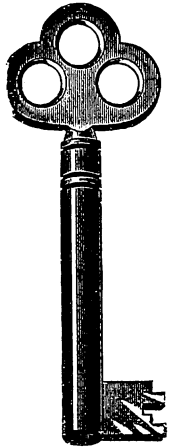
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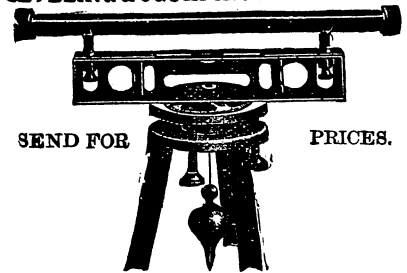
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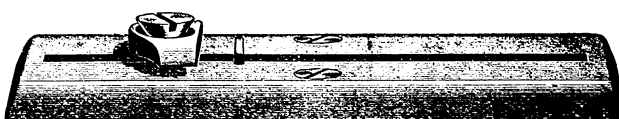


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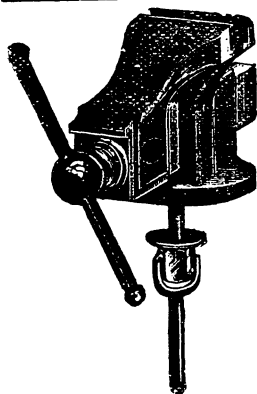
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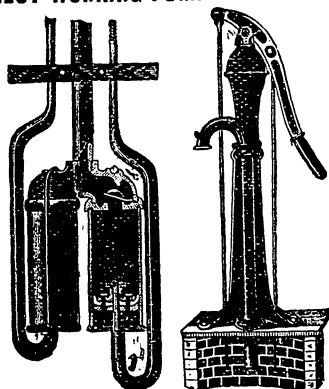


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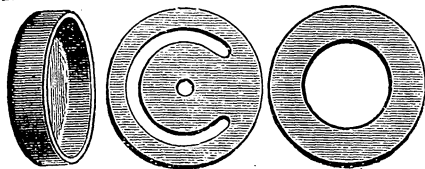
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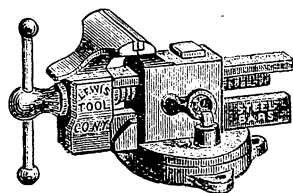
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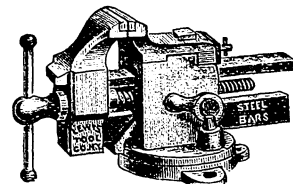
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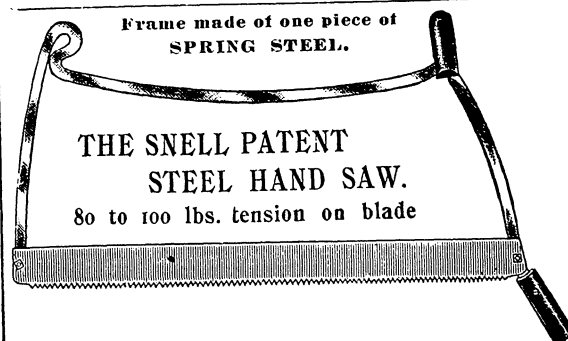
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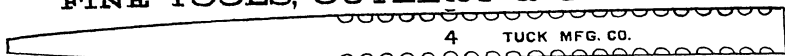
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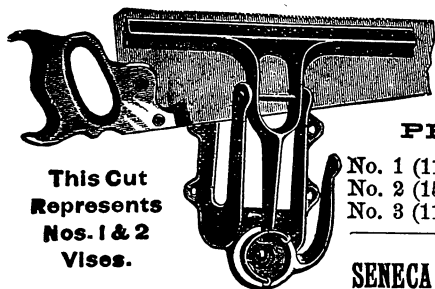
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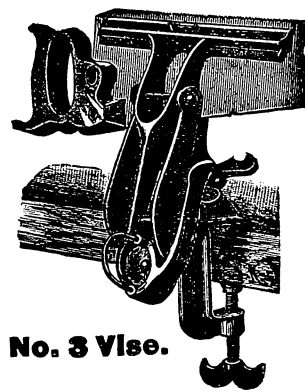
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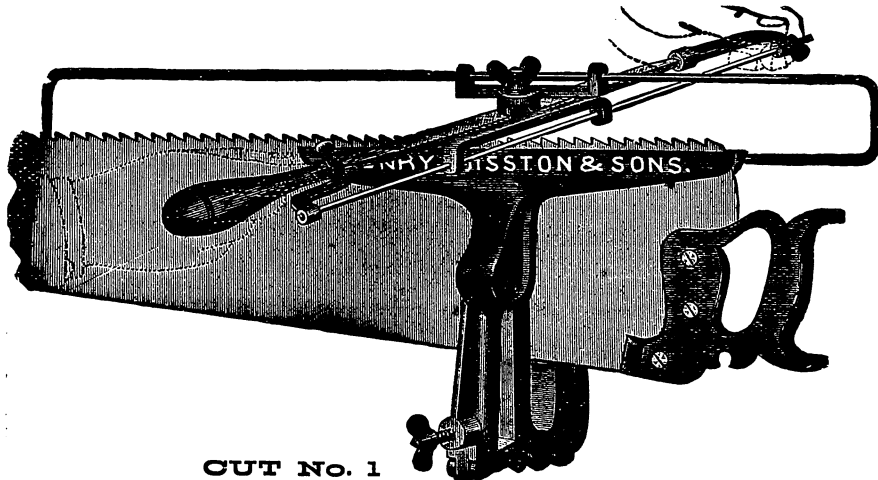
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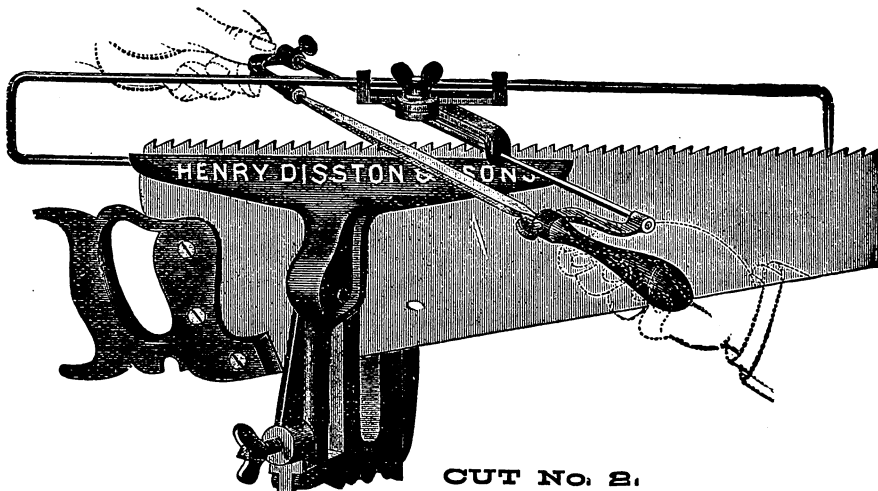
DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT No. 1

Cut No. 1 shows a saw and the attachment in proper position for filing the first side, and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

Write for price including No. 3 Clamp, Filing Guide, File and Handle complete: Packed one in a wooden box.

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WARRANTED FILES AND RASPS.

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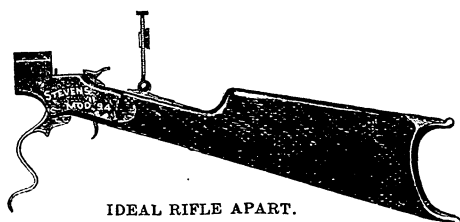
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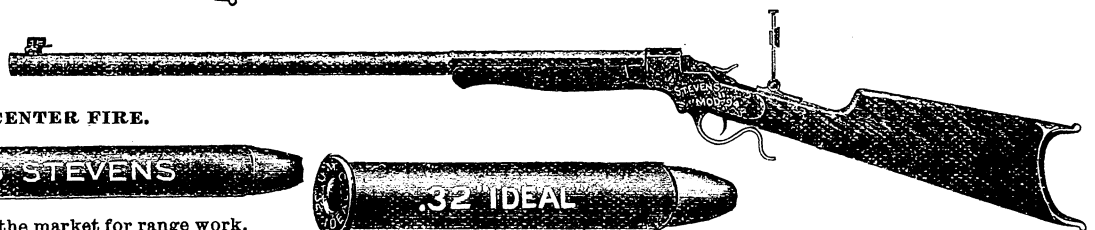
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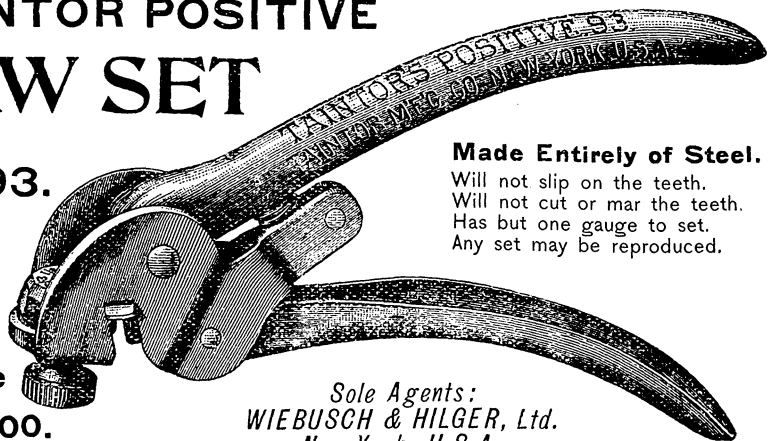
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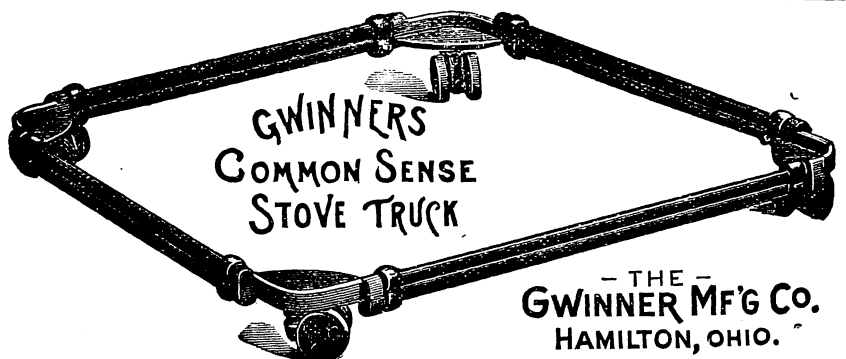
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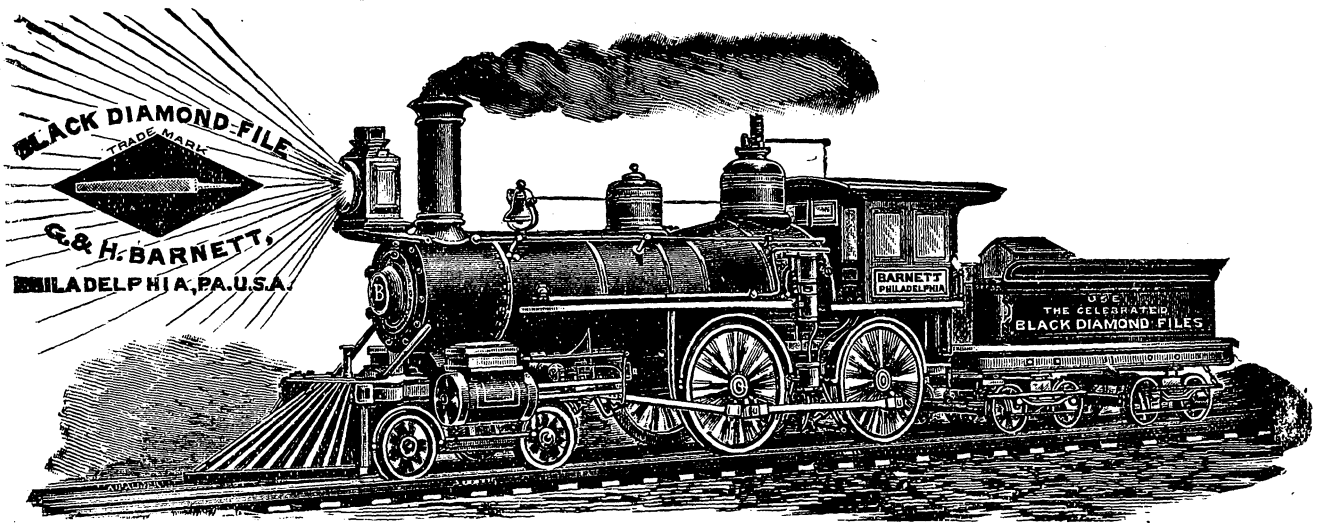
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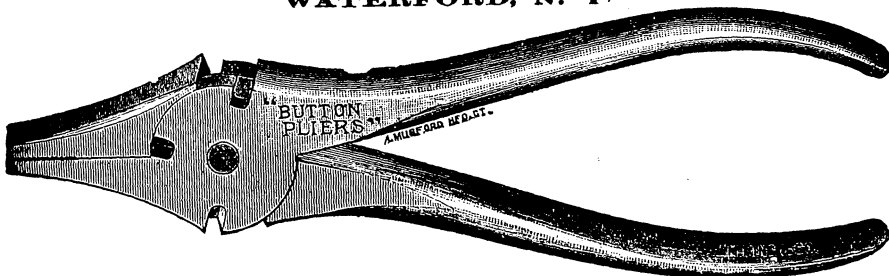
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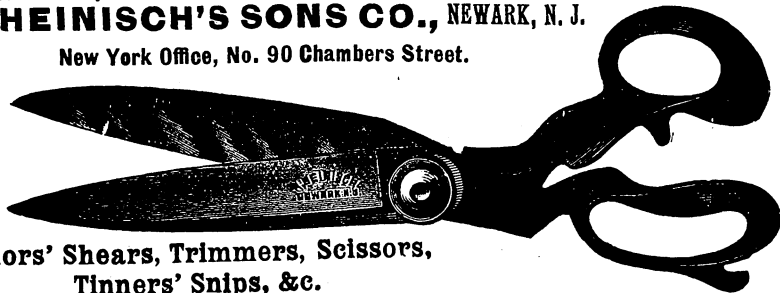
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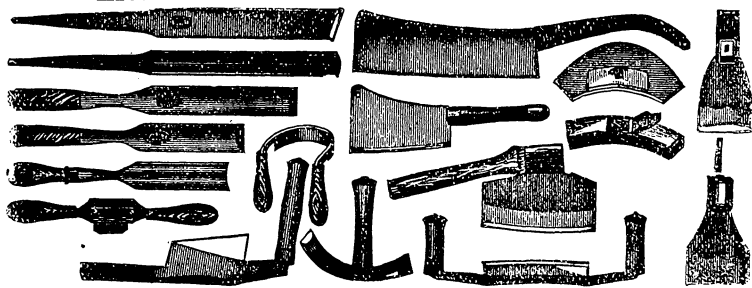
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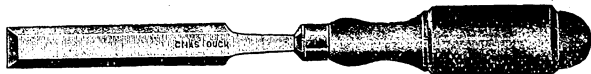
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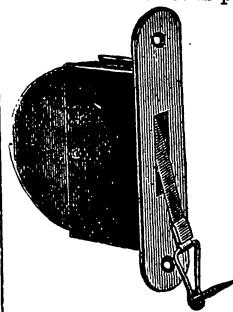
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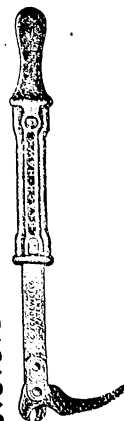
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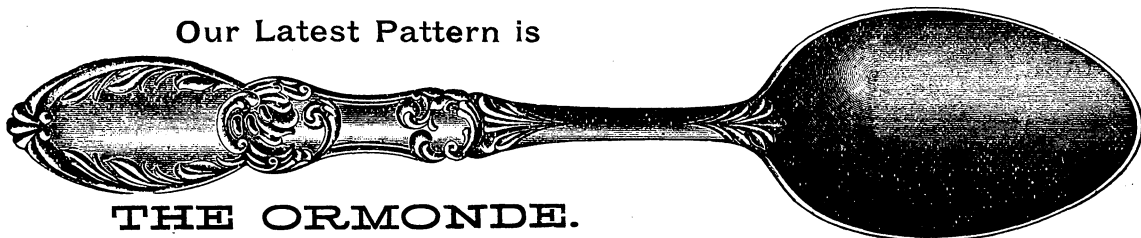
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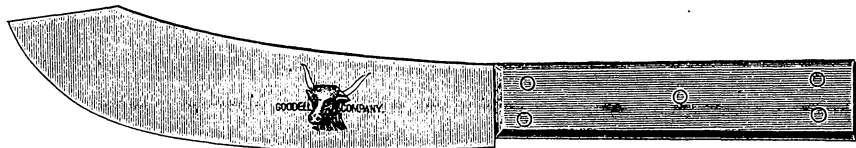
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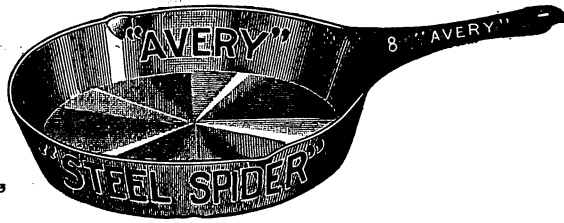
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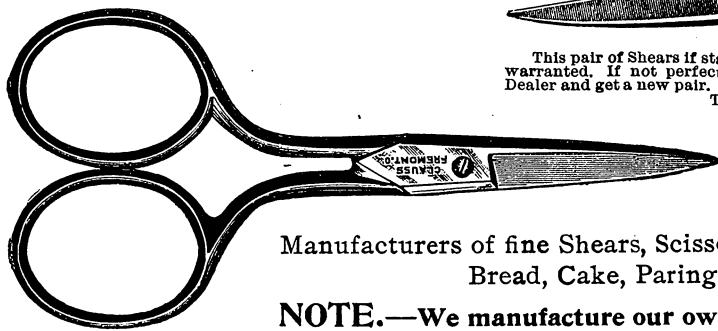
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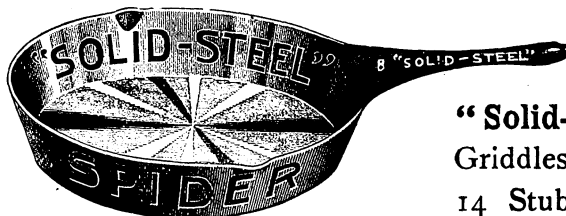
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"Solid-Steel" Spiders and Griddles are pressed **HOT** from 14 Stubbs' Gauge Steel and guaranteed not to warp.

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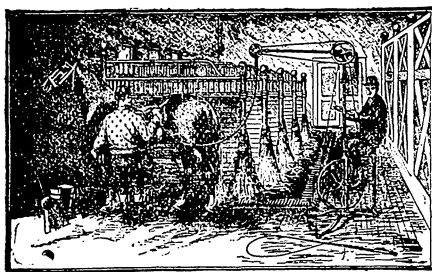
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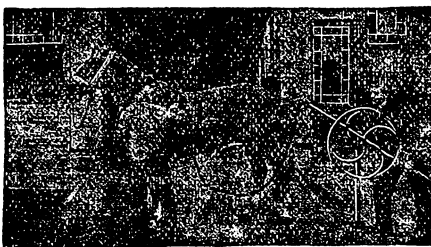
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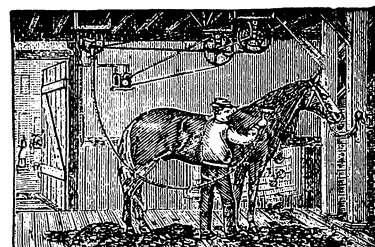
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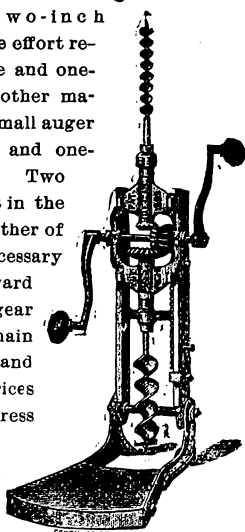
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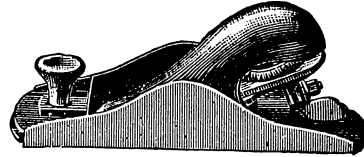
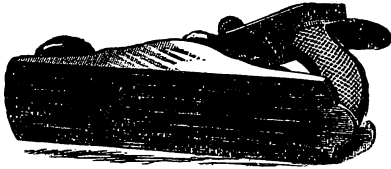
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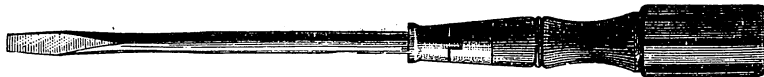
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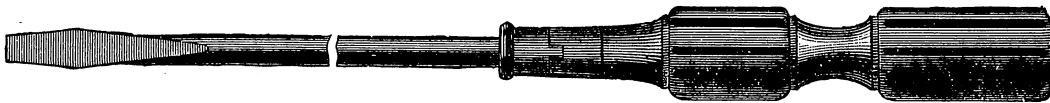
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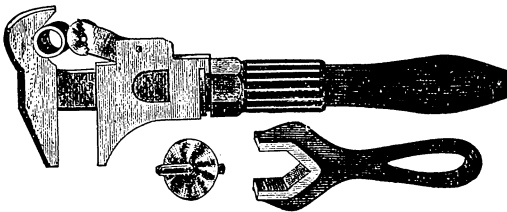


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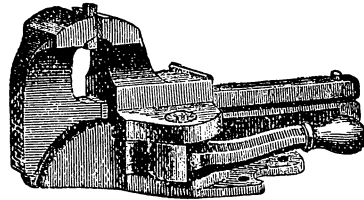


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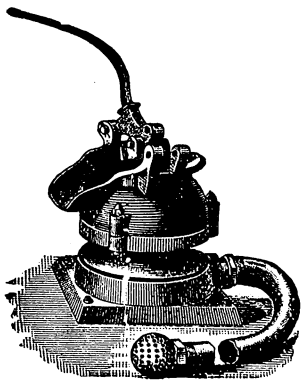
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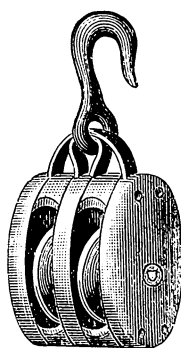
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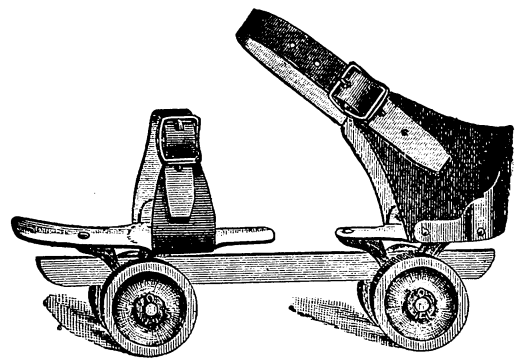
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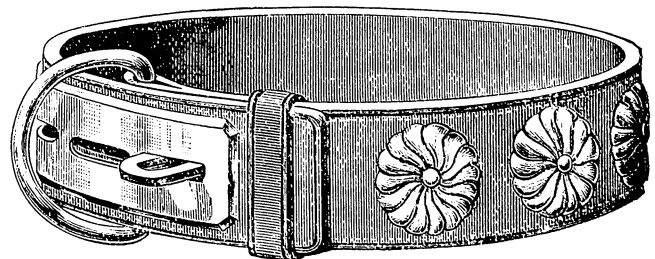
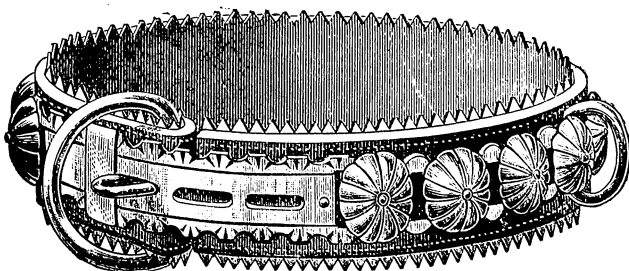
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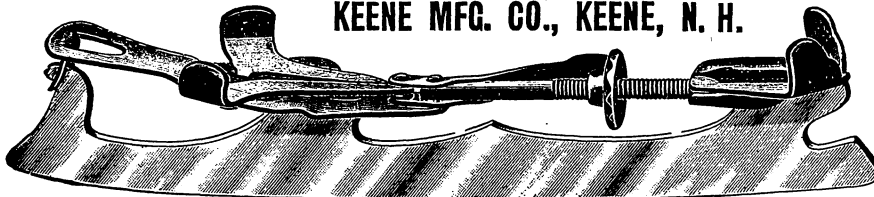
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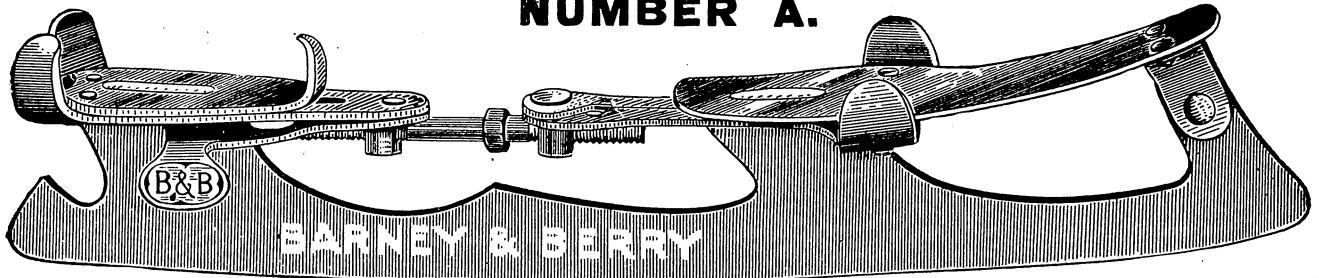
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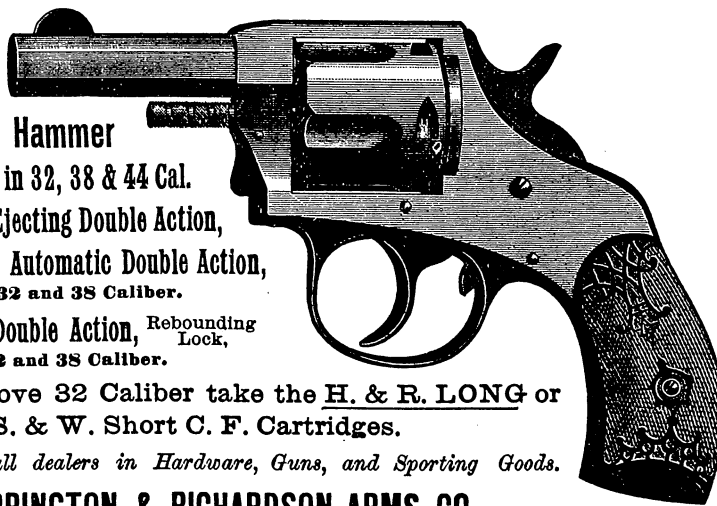
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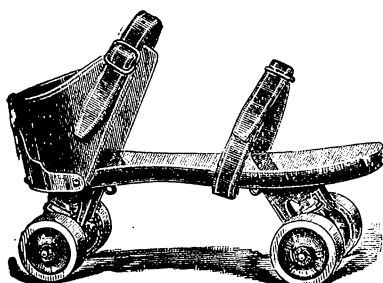
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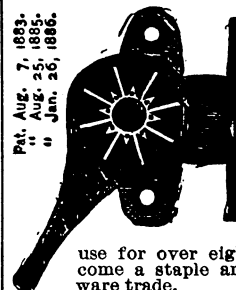


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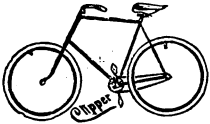
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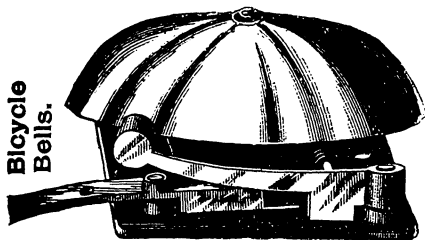
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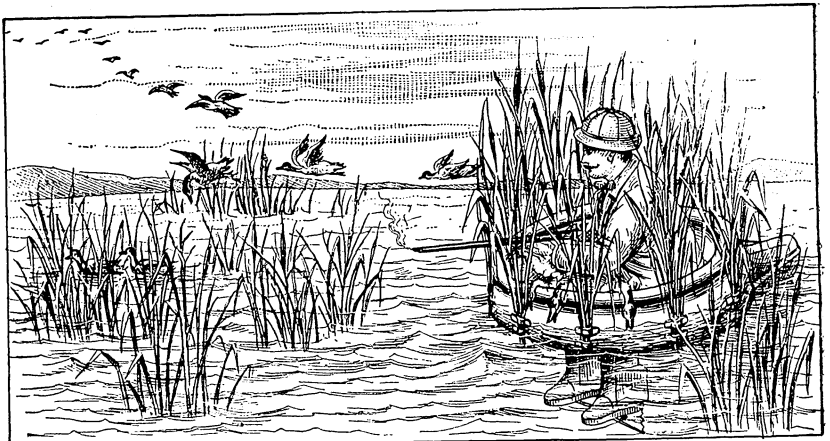
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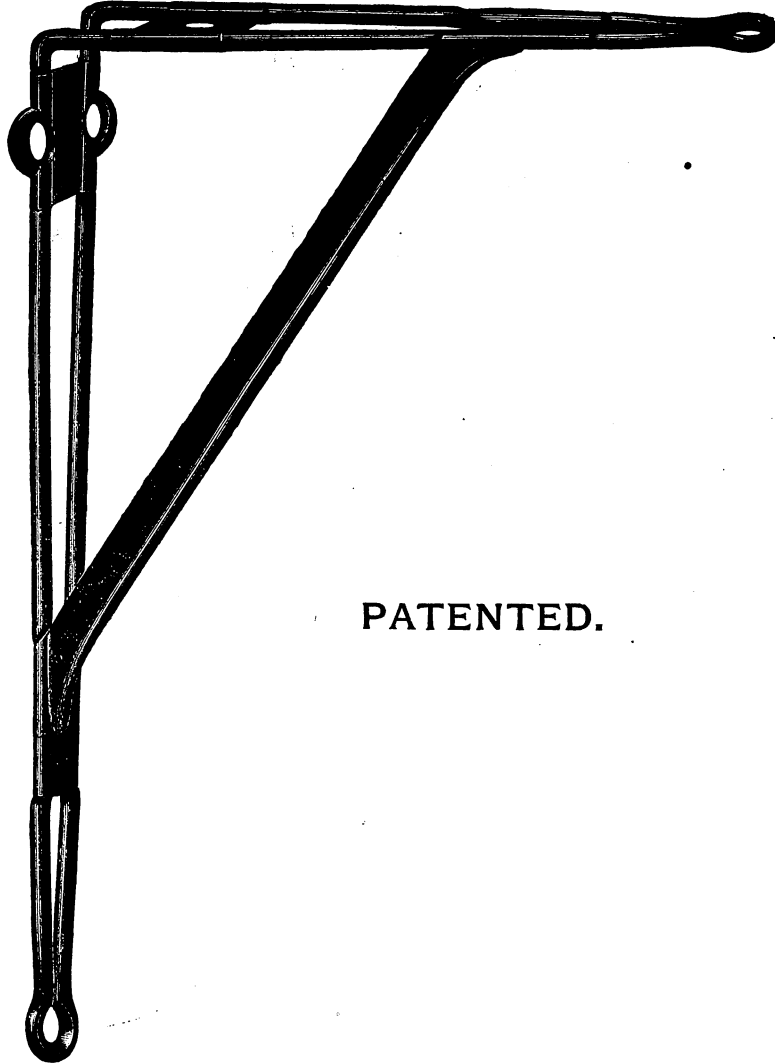
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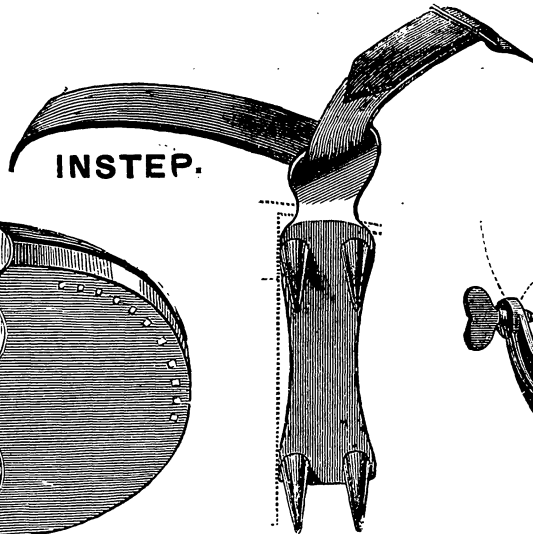
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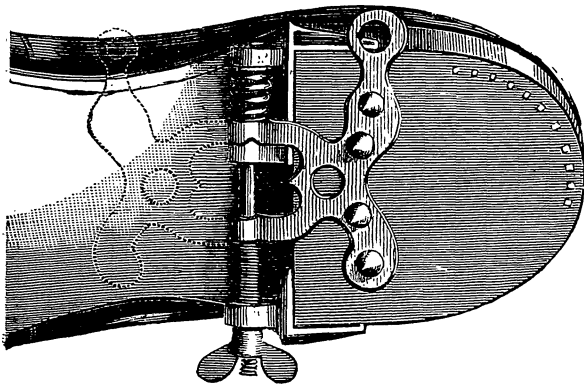
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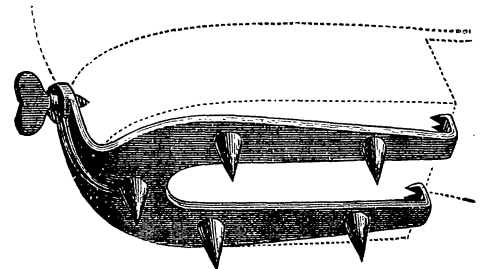
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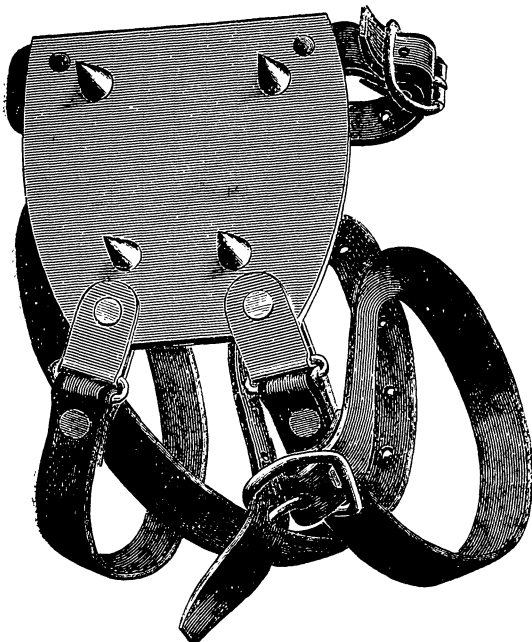


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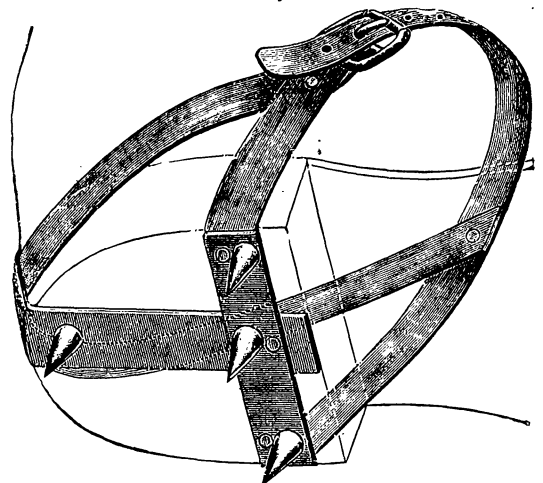


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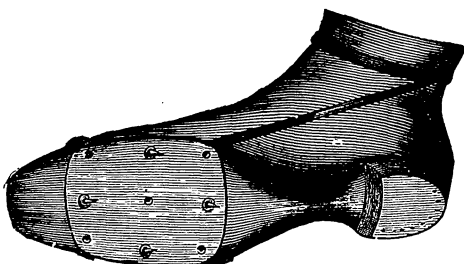
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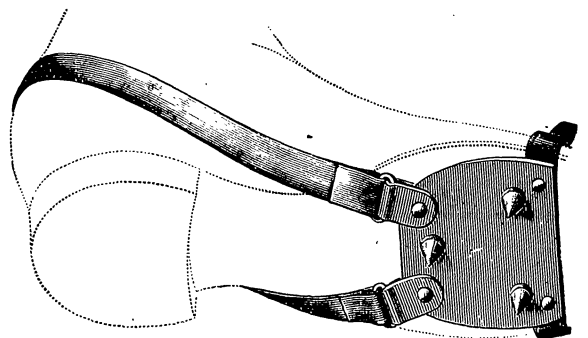


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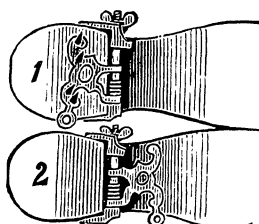
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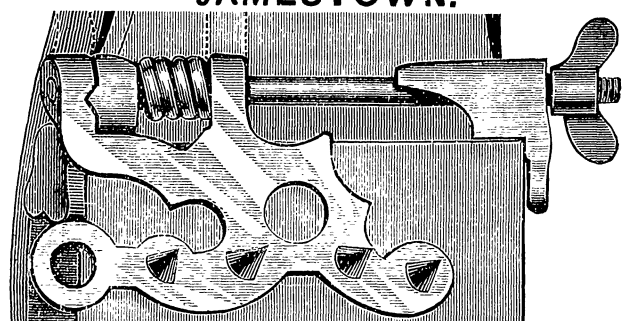
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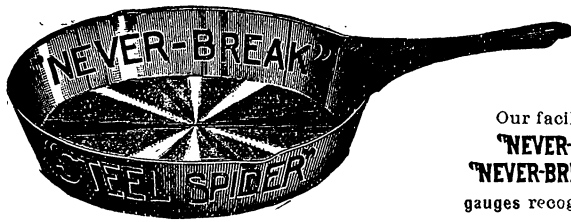
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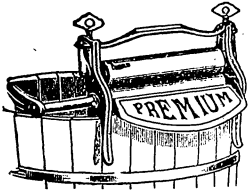
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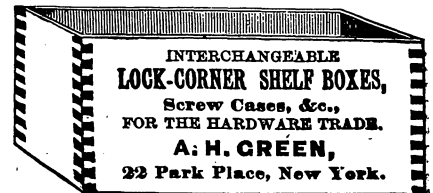
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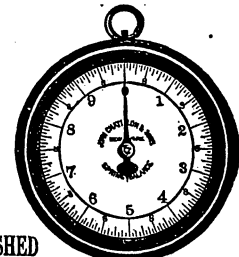
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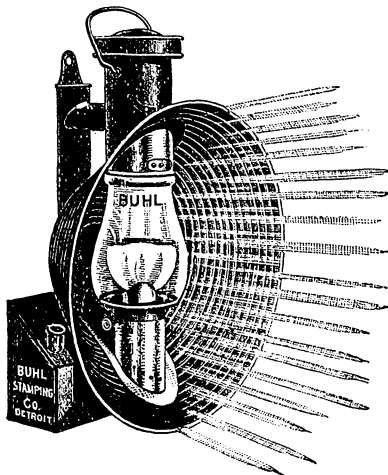


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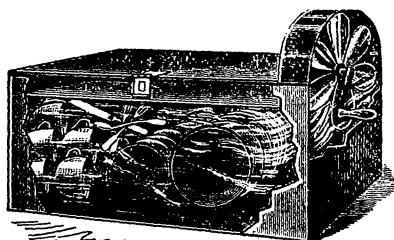
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One-Minute Dish Washers.

Gas Soldering Iron, - \$2.

Soldering without a Stove. Iron always hot.

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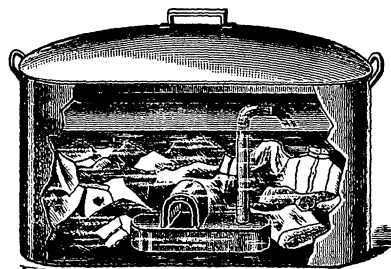
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Save 4-5 the cost of Gas. Heat intense.

No. 1, \$5; No. 2, \$7.50;

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Gas Cooking Stoves,

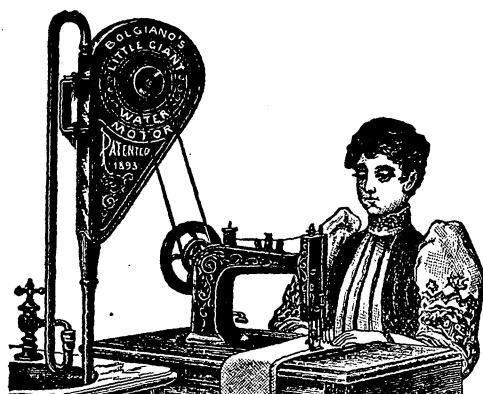
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Washes without scrubbing in 15 minutes.

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Consumes all the Odor of the Kitchen
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Reliable Torches are
what you want.Made either for Oil or
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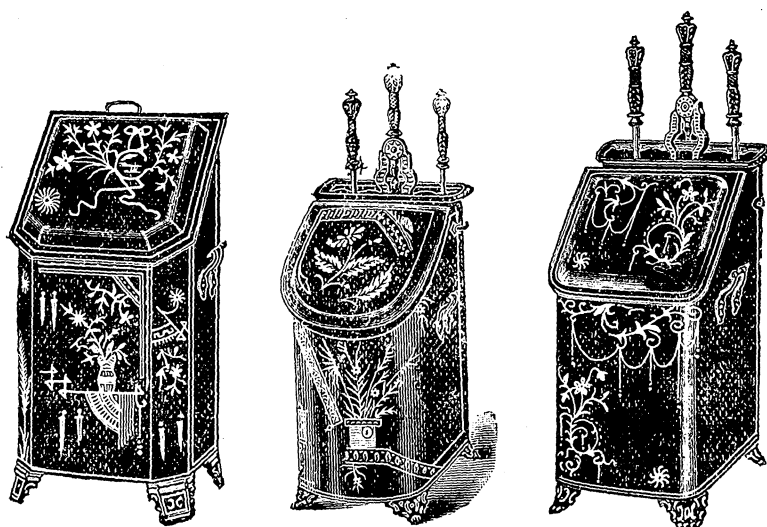
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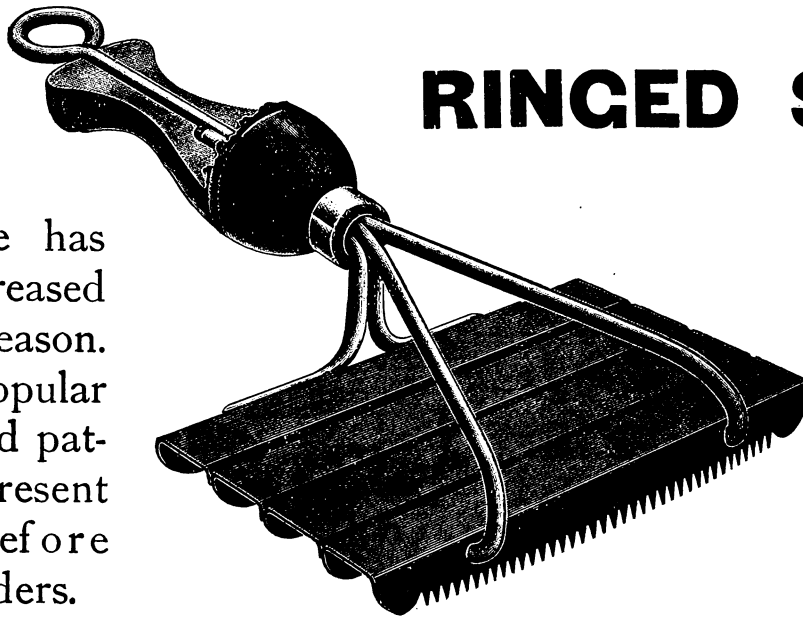
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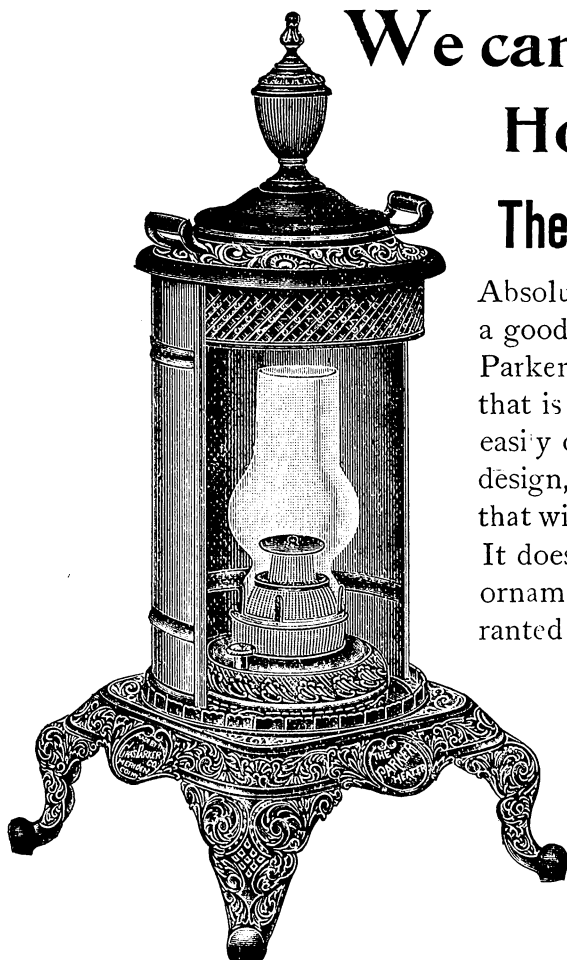
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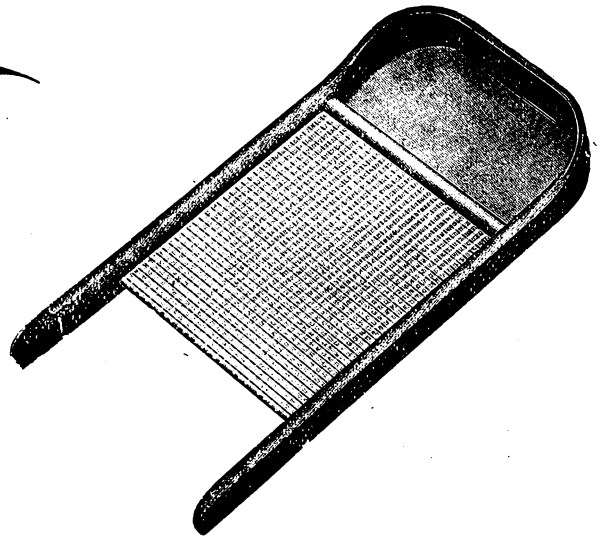
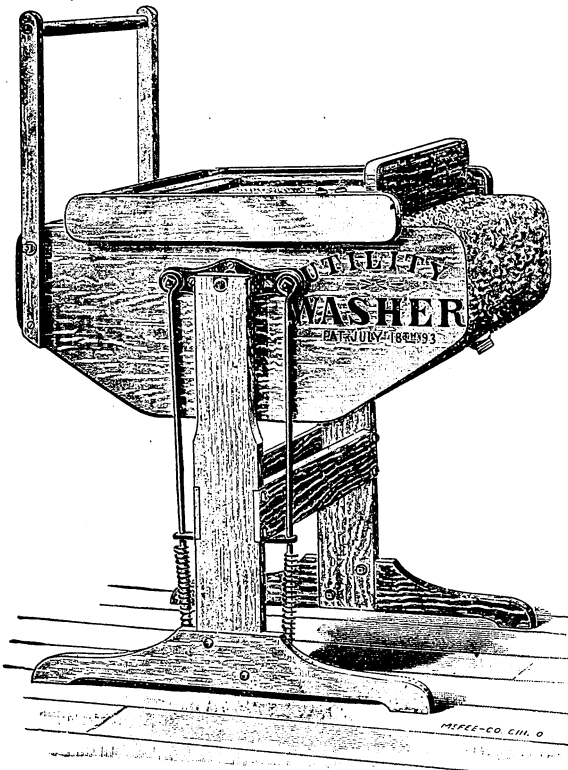
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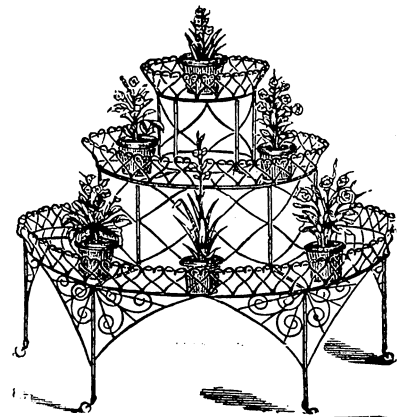
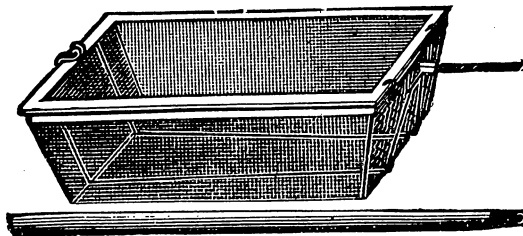
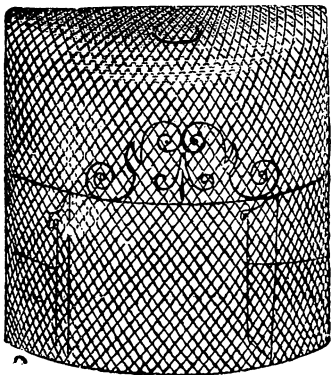


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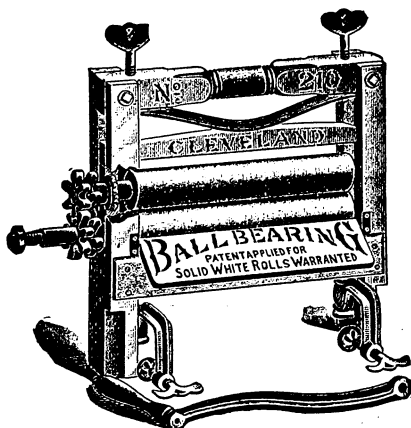
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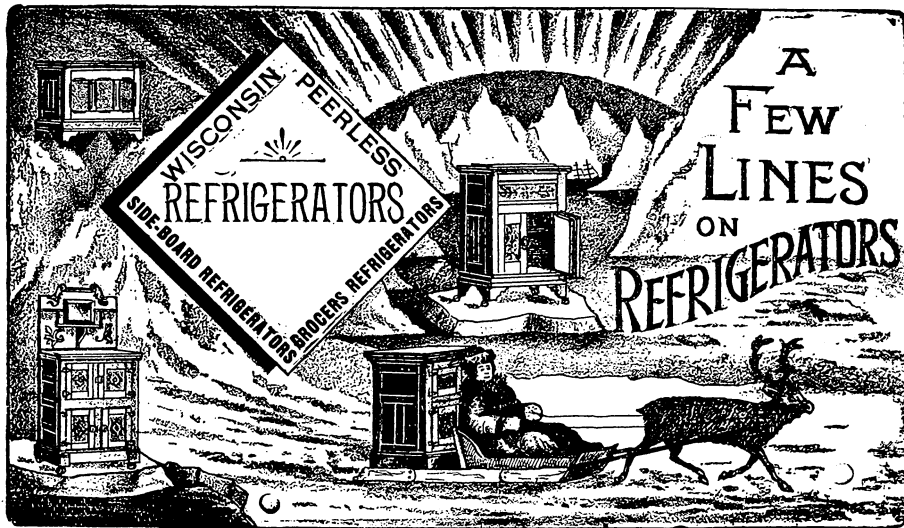
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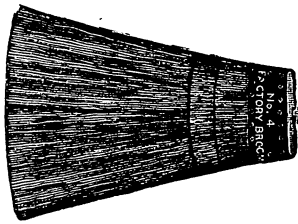
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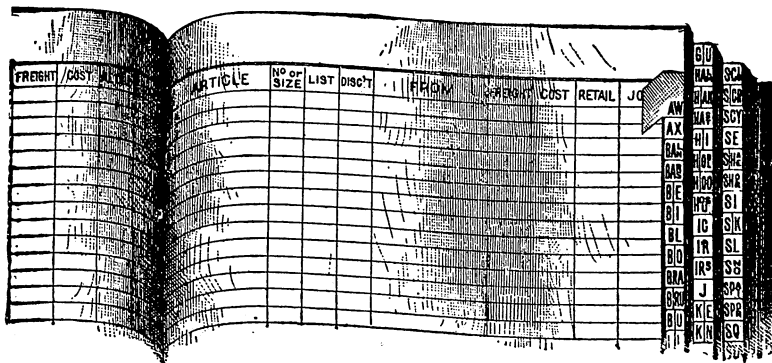
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For Augers,	turn to	AU	For Chisels,	turn to	CH	For Iron,	turn to	IRO
" Parers, Apple	"	PAP	" Cutlery,	"	CUT	" Irons,	"	IR'S
" Saws,	"	SAW	" Cartridges,	"	CAR	" Shovels,	"	SHO
" Pumps,	"	PUM	" Rules,	"	RUP	" Grindstones,	"	GRI
" Bits,	"	BIT	" Locks,	"	LO	" Stones,	"	STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for any overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

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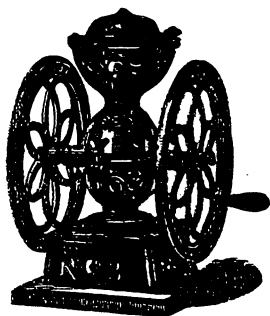
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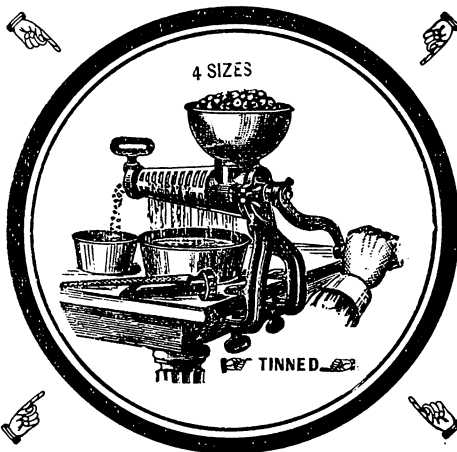
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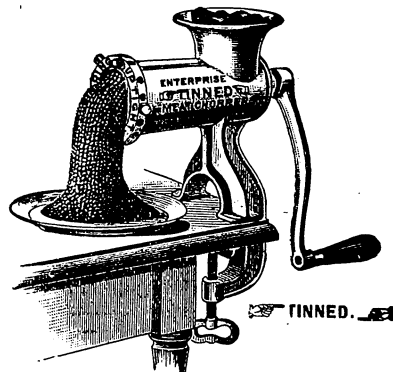
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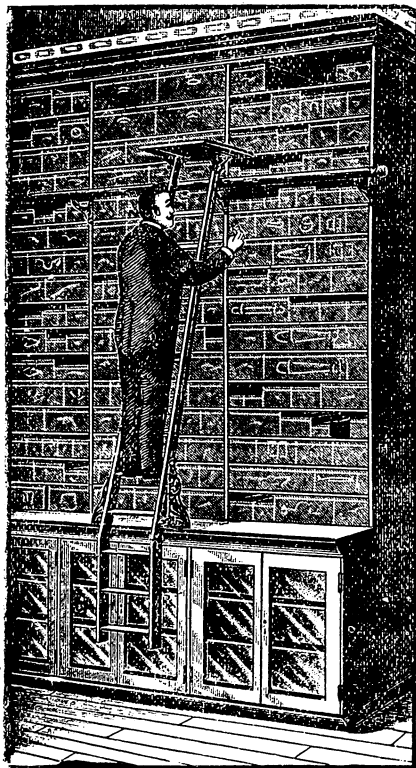


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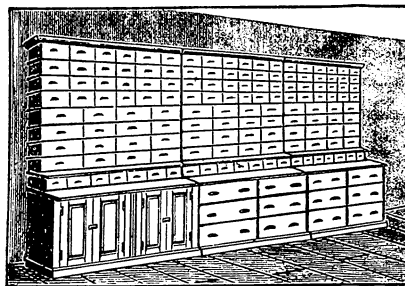
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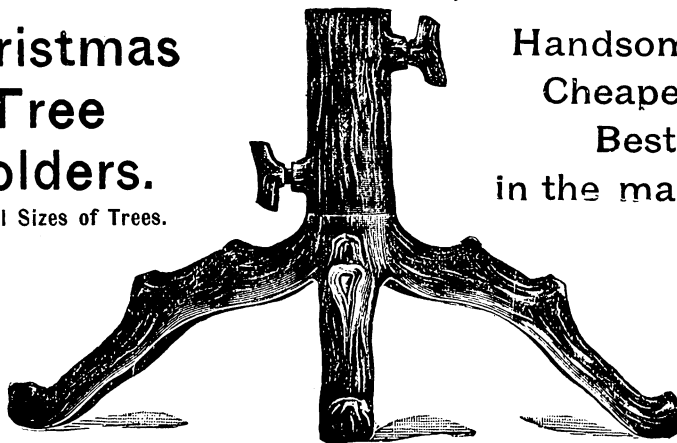
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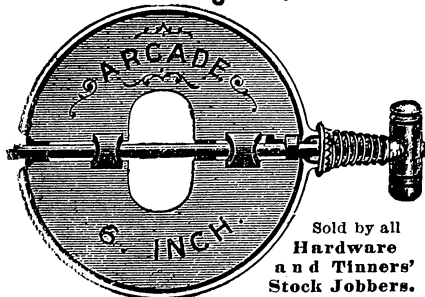
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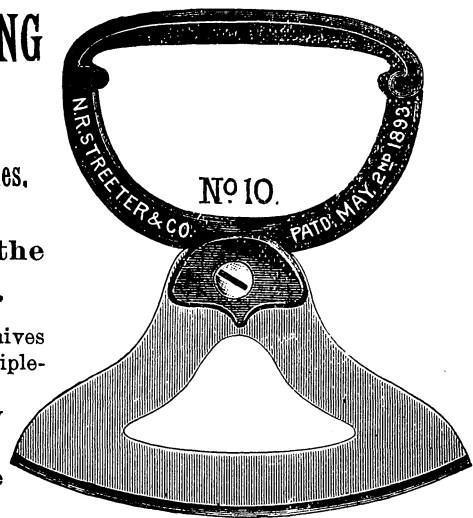
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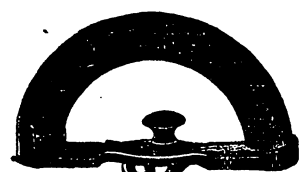
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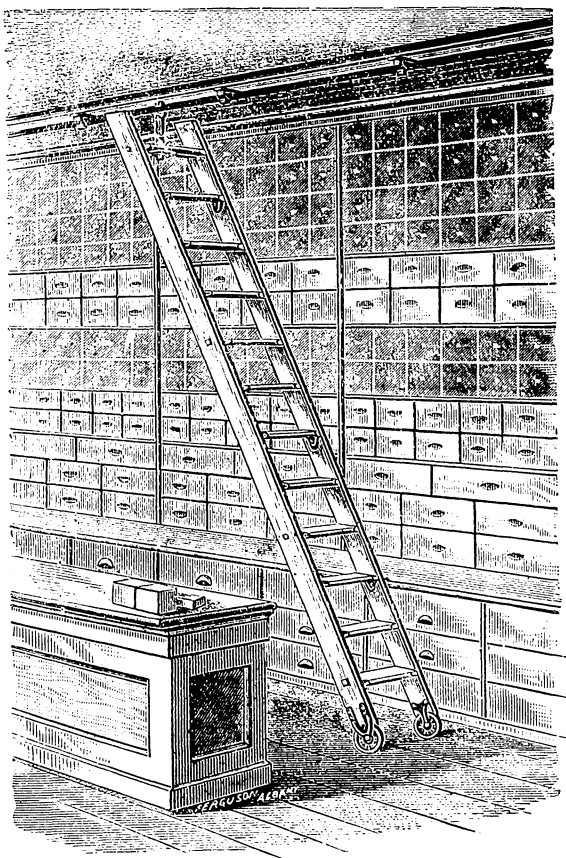
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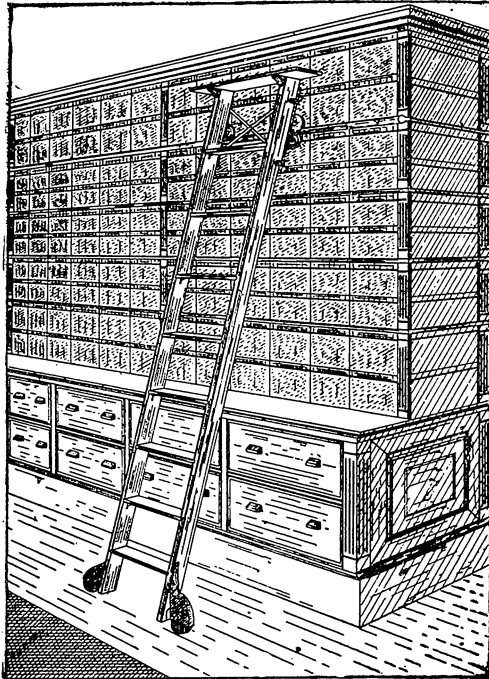
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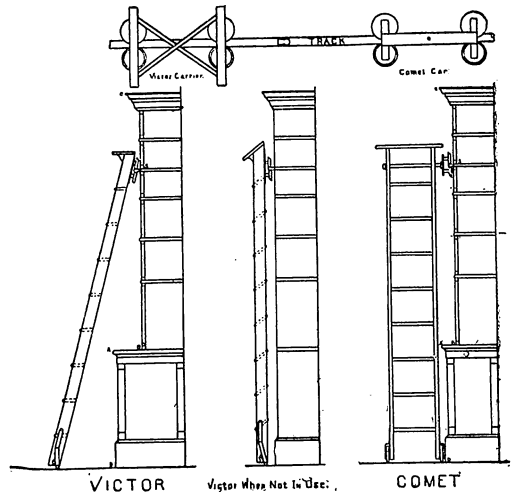
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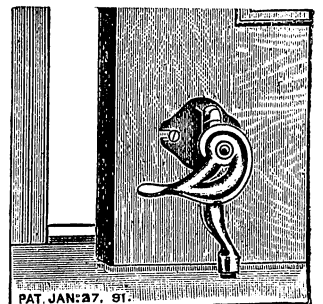
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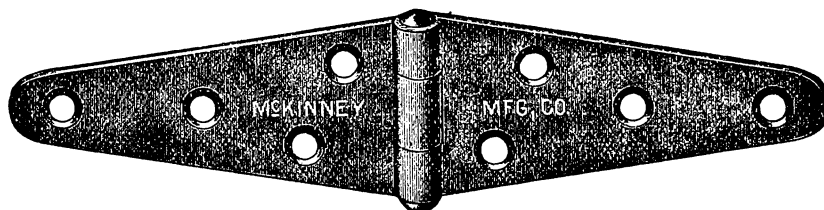
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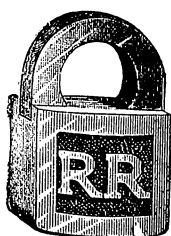
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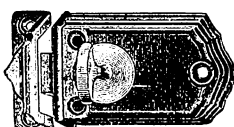


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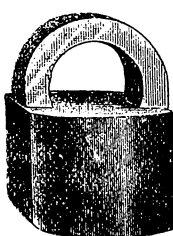
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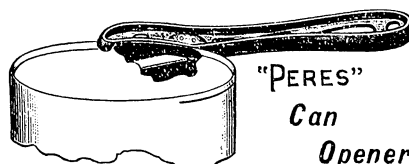
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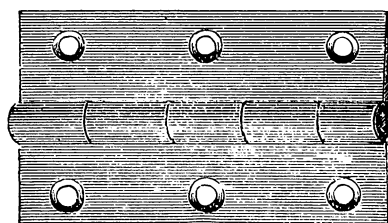
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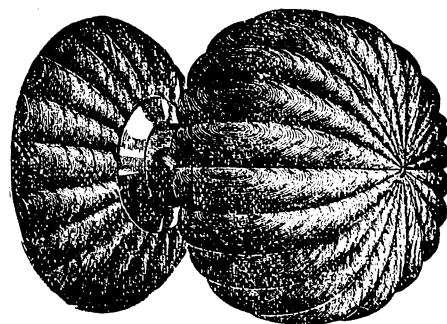
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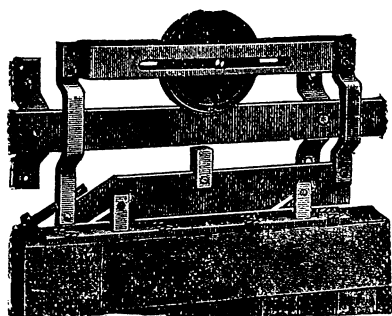


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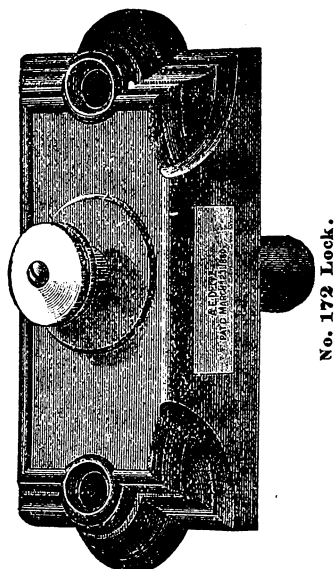
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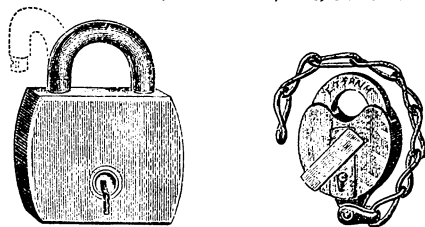
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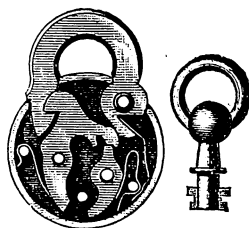
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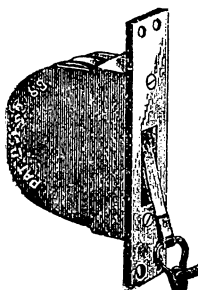
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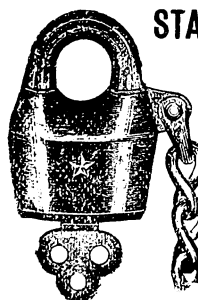
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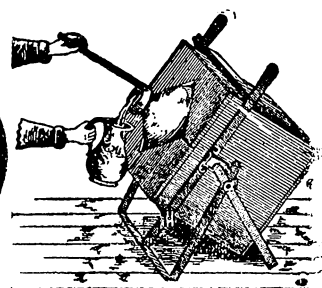
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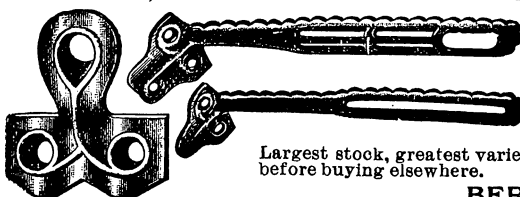
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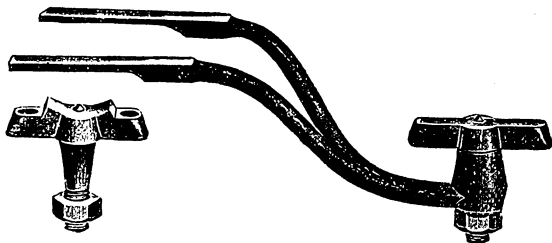


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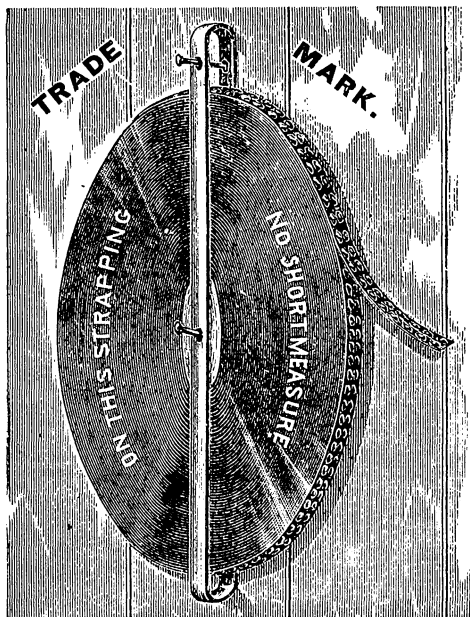
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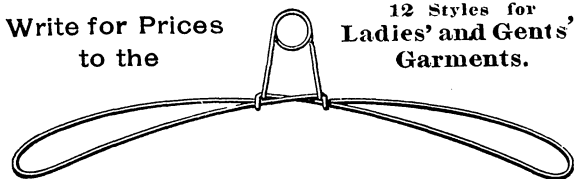
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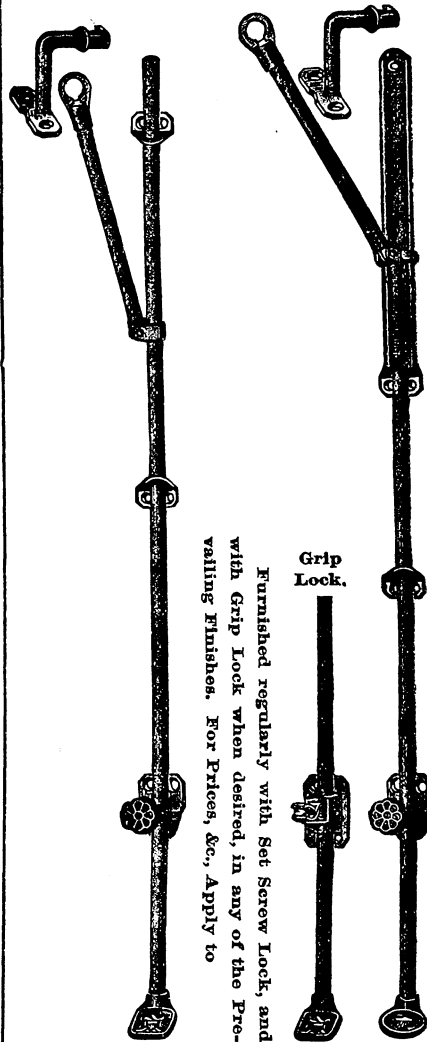


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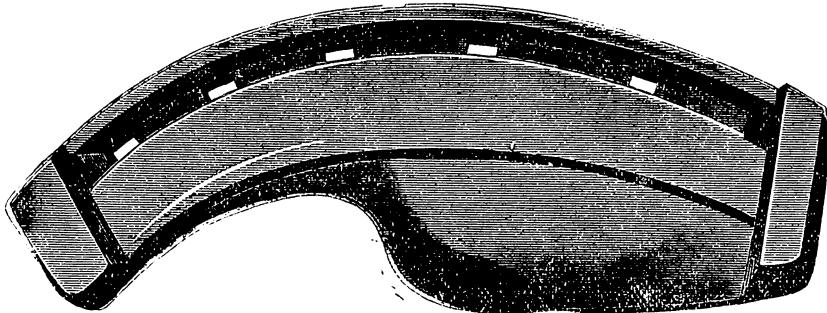
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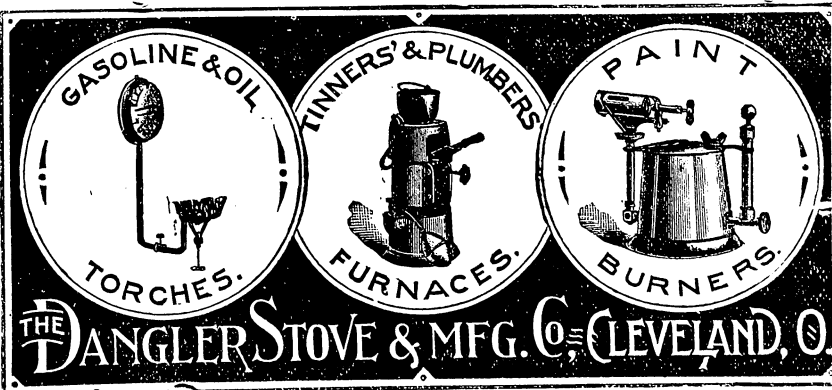
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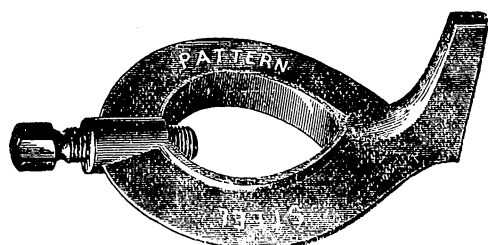
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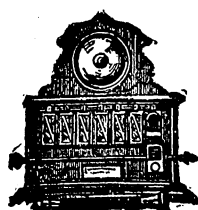
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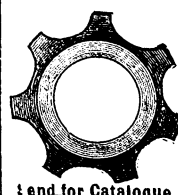
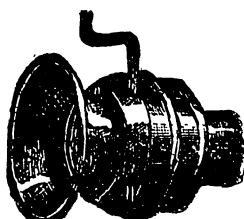


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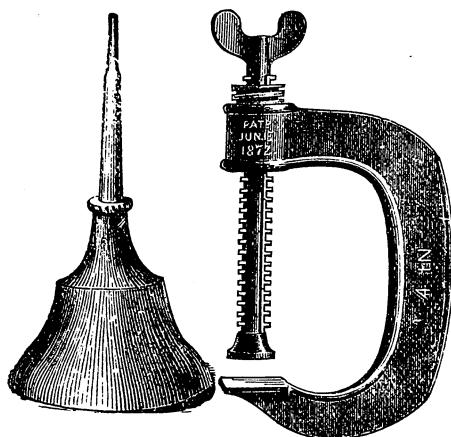
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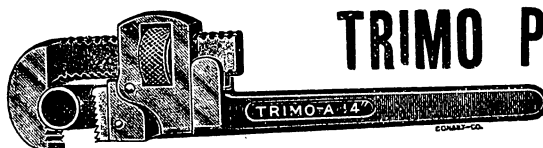
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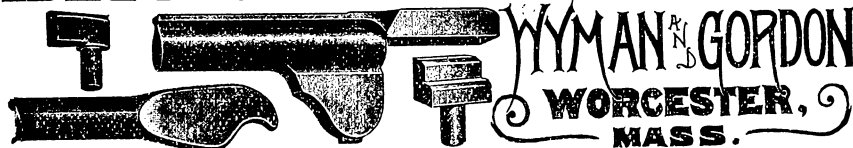
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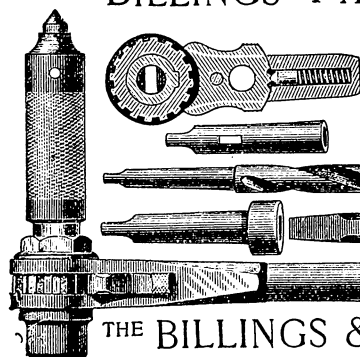
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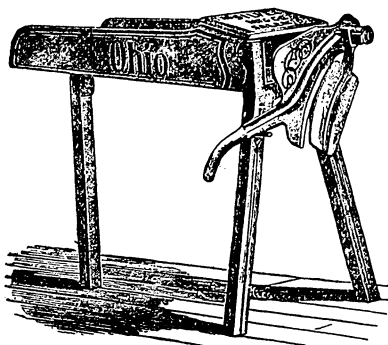
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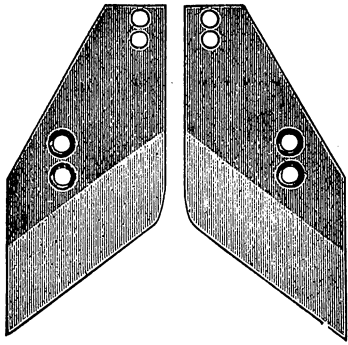
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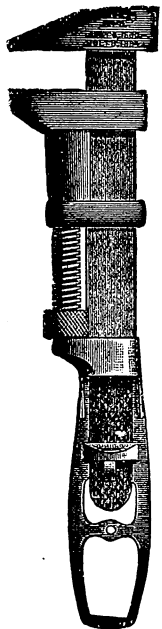
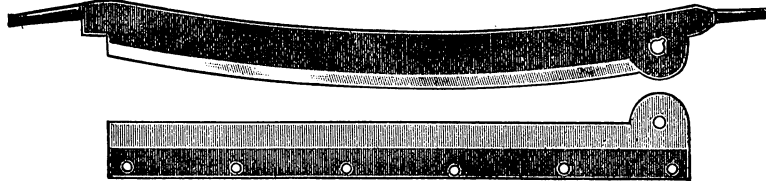
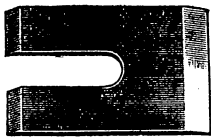


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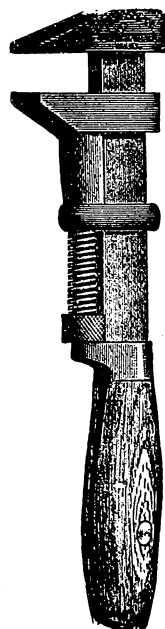
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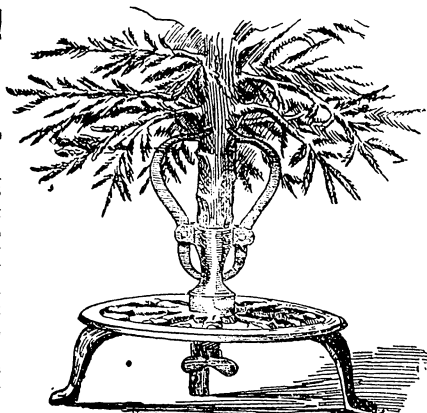
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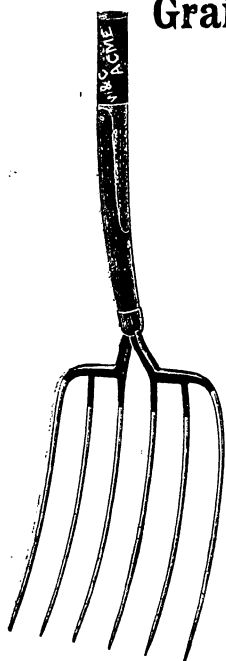
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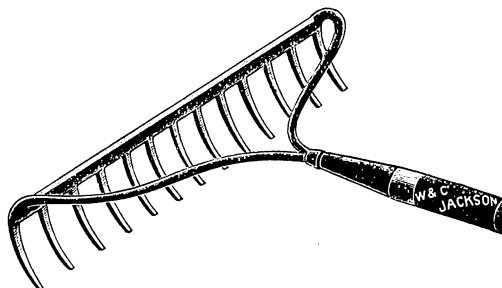
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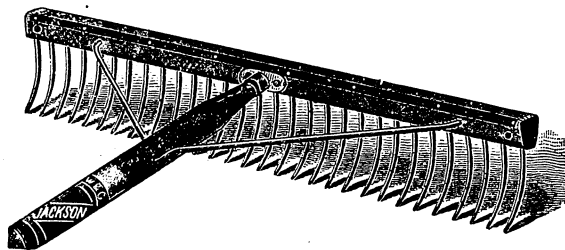
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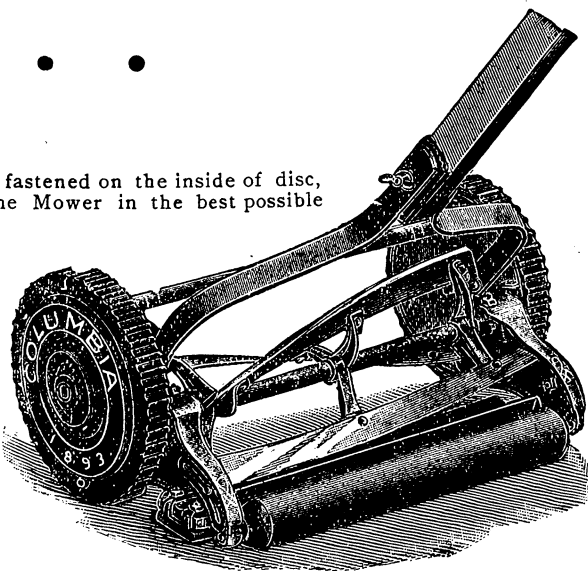
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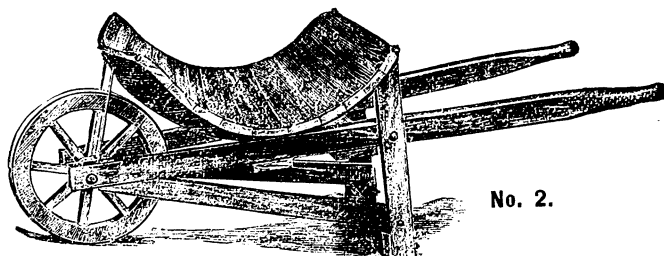
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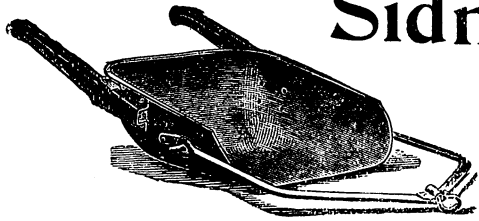
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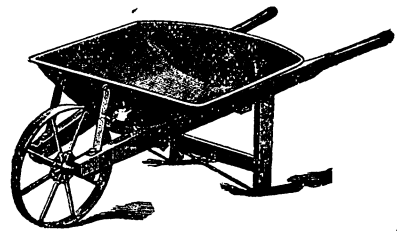
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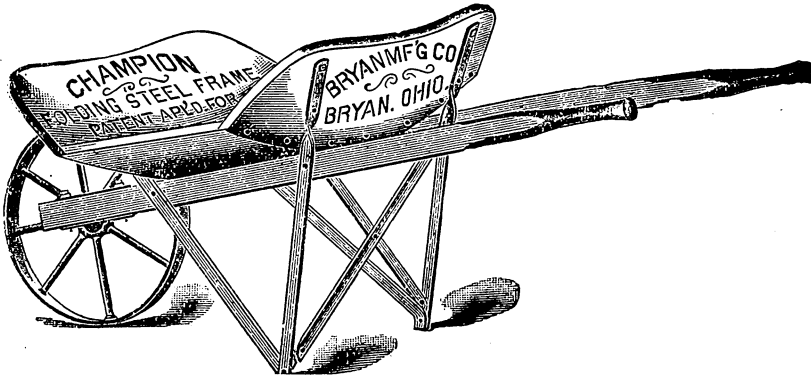
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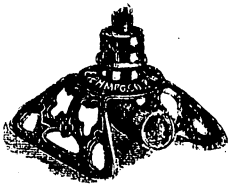


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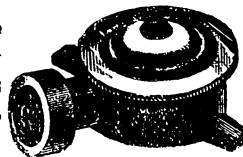


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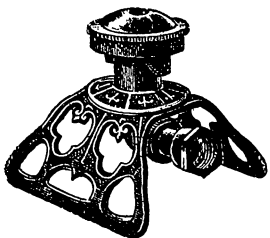
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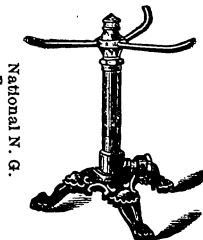


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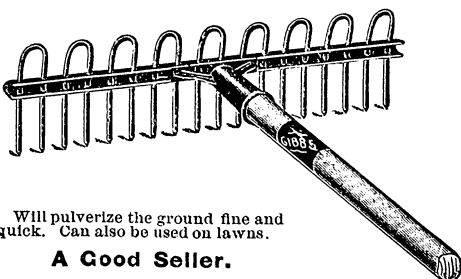
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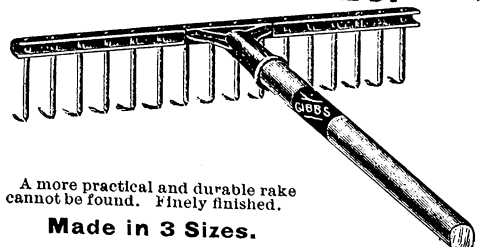
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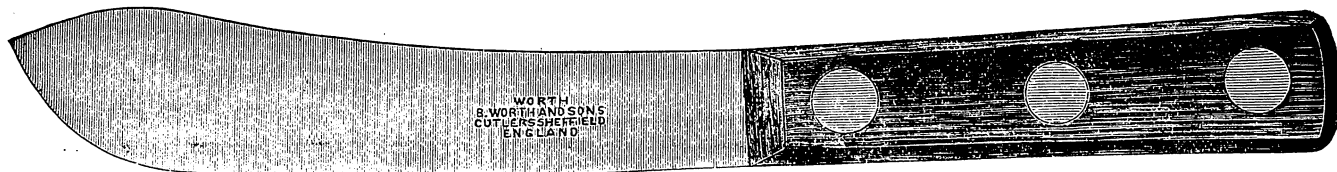
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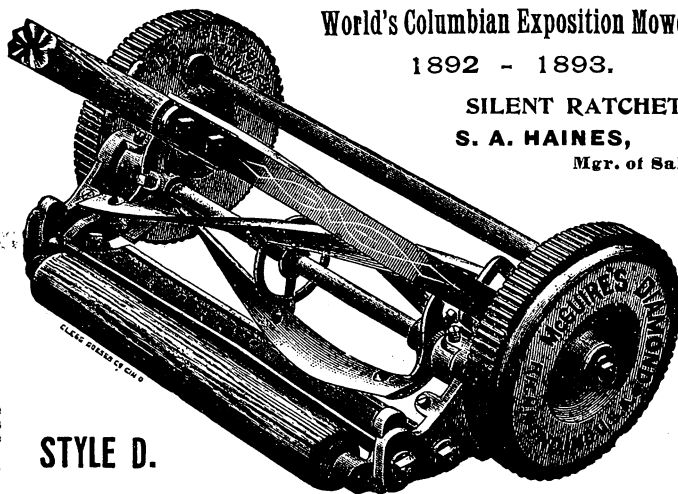
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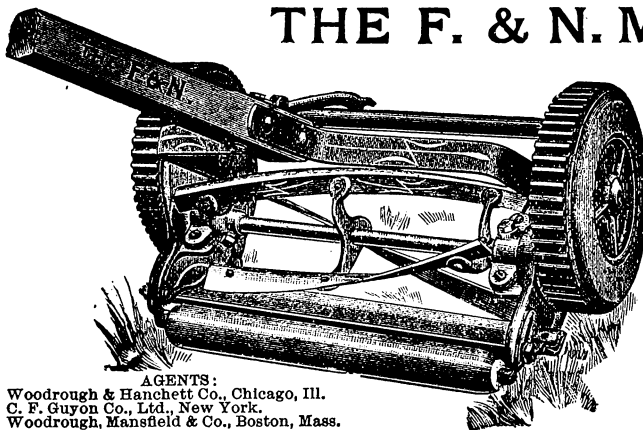
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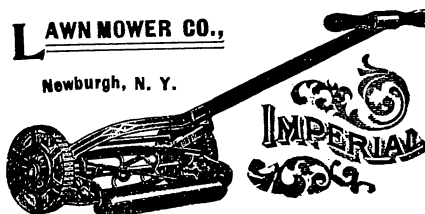


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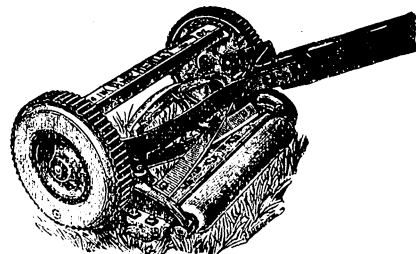
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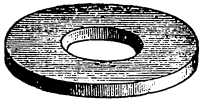
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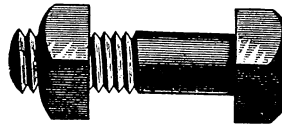
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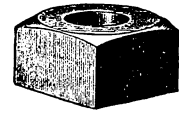
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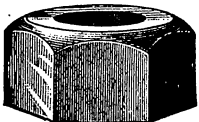
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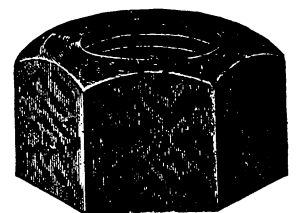


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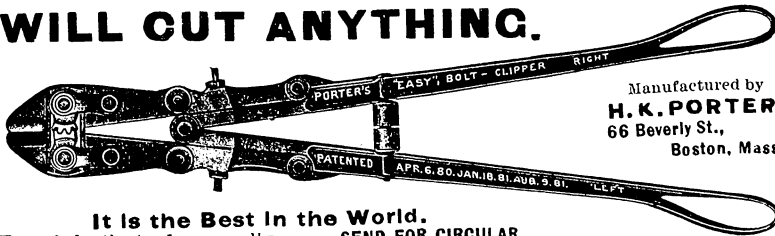


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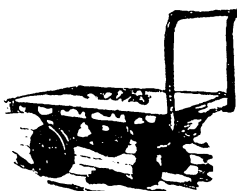
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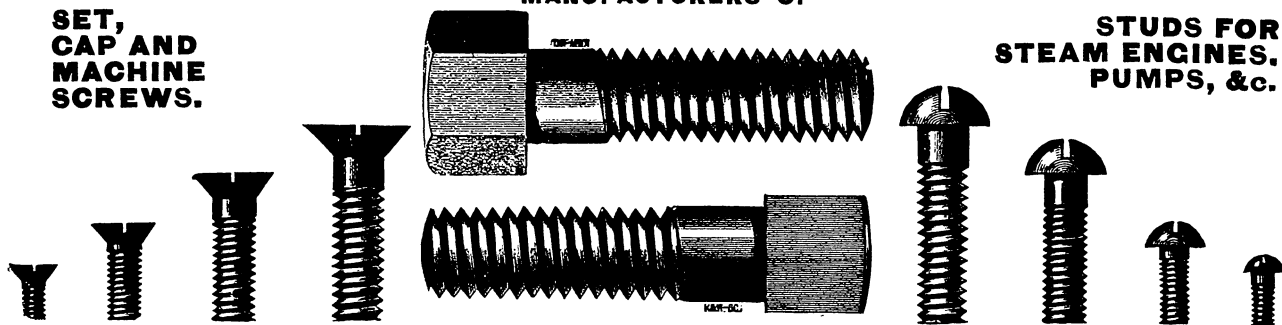


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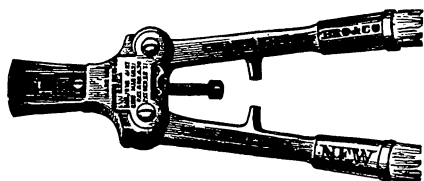


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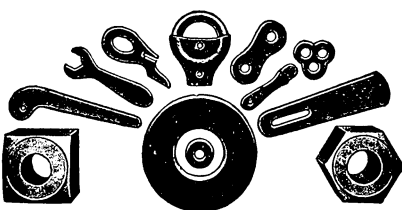
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Boiler Plates.
Carbon Steel Co., Pittsburgh, Pa.
McIlvain, Wm. & Sons, Reading, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Pottstown Iron Co., Pottstown, Pa.

Boilers, Copper.
Randolph & Clowes, Waterbury, Conn.

Boilers, Steam.
Babcock & Wilcox Co., 30 Cortlandt, Chandler & Taylor Co., Indianapolis, Ind.
Harrison Safety Boiler Wks., Phila., Pa.
Pollock, W. B. & Co., Youngstown, O.
Porter, H. K., Boston, Mass.
Southwark Fdy. & Mch. Co., Phila., Pa.
Sterling Co., Chicago, Ill.
Wetherill, Robt. & Co., Chester, Pa.

Boil Cutters.
Chambers Bros. Co., Philadelphia.
Howard Iron Works, Buffalo, N. Y.
Porter, H. K., Boston, Mass.
Wells Bros. & Co., Greenfield, Mass.

Books.
Republic Press, 14 Lafayette Place, N. Y.
Williams, David, 96-102 Reade, N. Y.

Boring Machines.
Buckeye Mfg. Co., Union City, Ind.

Box Banders.
Goodell, J. W., Burlington, Vt.

Boxes, Hdw. Shelf, &c.
Green, A. H., 22 Park Place, N. Y.
Jones, Jesse & Co., Philadelphia, Pa.

Box Straps and Corners.
Cary Mfg. Co., 5 to 9 Elm St., N. Y.

Brass, Manufacturers of.
Ansonia Brass & Copper Co., N. Y.
Bavol, John & Sons, 100 John, N. Y.
Plume & Atwood Mfg. Co., N. Y.
Randolph & Clowes, Waterbury, Conn.
Rome Brass & Copper Co., Rome, N. Y.
Scovill Mfg. Co., Waterbury, Conn.
Waterbury Brass Co., 296 Eway, N. Y.

Brass Butt Hinges.
Tiebout, W. & J., 16 & 18 Chambers.

Brass Founders.
Crump, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.
Eynons-Evans Mfg. Co., Philadelphia, Pa.
Fram, E. T., Lancaster, Pa.
Haight & Clark, Albany, N. Y.
Keys, W. W. & R. M. Co., Bridgeport, Conn.
North Bros. Mfg. Co., Phila., Pa.
Reeves, Paul S., Philadelphia.

Brass Goods.
Brass Goods Mfg. Co., 88 Chambers.

Bread and Cake Knives.
Clausen Shear Co., Fremont, O.

Bronze (Tobin).
Ansonia Bronze & Copper Co., 19-21 Cliff Street, N. Y.
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.

Brooms and Brushes.
Lay, Jos. & Co., Ridgely, Ind.
Rice Mfg. Co., New Durham, N. H.

Builders' Hardware.
Deitz, A. E., 97 Chambers St., N. Y.
Reading Hdw. Co., Reading, Pa.
South, W. A. Co., Salem, Mass.
Yale & Towne Mfg. Co., Stamford, Ct.

Burr Wheels.
Torrance Iron Co., Troy, N. Y.

Butchers' Steels.
Chatillon, John & Sons, 85-89 Cliff St., N. Y.

Butcher and Shoe Knives, Manufacturers of.
Chatillon, John & Sons, 85-89 Cliff St., N. Y.
Goodell Co., Antrim, N. H.
Wilson, John, Sheffield, England.

Butts and Hinges.
Clark Mfg. Co., Buffalo, N. Y.
McKinney Mfg. Co., Allegheny, Pa.
Sabin Machine Co., Montpelier, Vt.

Stanley Works, New Britain, Conn.
Tiebout, W. & J., 16 Chambers, N. Y.
Wrightsville Hdw. Co., Wrightsville, Pa.

Cabinet Benches.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

Calipers and Dividers.
J. Stephens Arms and Tool Co., Chicopee Falls, Mass.
Starrett, L. S., Athol, Mass.

Car Axles.
Roberts, A. & P. & Co., Phila.

Carboy Stands.
Wolf, W. & L., Philadelphia, Pa.

Carriage Hardware, Makers of.
Clapp, E. D. Mfg. Co., Auburn, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
Eccles, Richard, Auburn, N. Y.
Scranton Forging Co., Scranton, Pa.
Smith, H. D. & Co., Plantsville, Conn.
Wilcox & Howe, Birmingham, Conn.

Cartridge Reloading Tools.
Ideal Mfg. Co., New Haven, Conn.

Carvers' Tools.
White, Van Glahn & Co., 15-17 Chatham Square, N. Y.

Casters, Wheel, &c.
Clark G. P., Windsor Locks, Conn.

Castings, Iron and Steel.
Allentown Hdw. Wks., Allentown, Pa.
Booth, The Lloyd Co., Youngstown, O.
Boston Casting Co., So. Boston, Mass.
The Burr & Houston Co., Brooklyn, N. Y.

Cheney, S. & Son, Manlius, N. Y.
Chester Steel Casting Co., Phila.
Chrome Steel Works, Brooklyn, N. Y.
Eureka Cast Steel Co., Chester, Pa.
Flagg, Stanley G. & Co., Phila.
Garland Foundry Co., Cleveland, O.
Haight & Clark, Albany, N. Y.
Palmer & De Mooy Fury Co., Cleveland, O.

Parsons, R. E. Co., Bridgeport, Conn.
Pratt & Cady Co., Hartford, Conn.
Sessions Foundry Co., Bristol, Conn.
Shickle, Harrison & Howard Iron Co., St. Louis, Mo.

Spencer, J. S. Sons, Guilford, Conn.
Standard Fdy. & Mfg. Co., Cleveland, O.
Torrance Iron Co., Troy, N. Y.
Union Lock & Hdw. Co., Lancaster, Pa.
Walker Mfg. Co., Cleveland, Ohio.
Wetherill, Robert & Co., Chester, Pa.
Wilcox, Crittenden & Co., Middletown, Conn.

Castings, Malleable.
Arcade Malleable Iron Co., Worcester.
Hammer & Co., Branford, Conn.
Torrance Iron Co., Troy, N. Y.

Catalogue Files.
Folding Paper Box Co., So. Bend, Ind.

Chains.
Bradlee & Co., Philadelphia.
Garland Chain Co., Rankin, Pa.
Link Belt Engineering Co., Phila., Pa.
McKay, Jas. & Co., Pittsburgh, Pa.

Check Punch.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Chimneys.
Phila. Engineering Works, Phila., Pa.

Chisels, Manufacturers of.
Buck Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.
White, L. & I. J. Co., Buffalo, N. Y.

Chucks.
Cushman Chuck Co., Hartford, Conn.
Skinner Chuck Co., New Britain, Conn.
Smith & Edge Mfg. Co., Bridgeport.
Union Mfg. Co., 103 Chambers, N. Y.
Whitlock, Wm., 39 Cortlandt St., N. Y.
Whitton, D. E. Mach. Co., New London, Conn.

Clamps.
Hammer & Co., Branford, Conn.
Le Count, C. W., So. Norwalk, Conn.

Clipping Machines.
Gillette Clipping Machine Co., 201 E. 23d Street, N. Y.

Coal.
Barns, C. K. & Co., Philadelphia, Pa.
Wister, Francis, Philadelphia, Pa.

Coal Hods and Vases.
Shepard, Sidney & Co., Buffalo, N. Y.

Coal and Hat Hooks.
Am. Wire Goods Co., Lowe I, Mass.

Coffee Mills.
Enterprise Mfg. Co., Phila., Pa.

Coke.
Barns, C. K. & Co., Philadelphia, Pa.
Houston, C. B. & Co., Philadelphia, Pa.
Rainey, W. J., Cleveland, O.
Wister, Francis, Philadelphia, Pa.

Collections.
Hardware Board of Trade (Limited), 4 and 6 Warren, N. Y.

Condensers.
Washington, Henry R., 86 & 88 Liberty Street, N. Y.

Conveying Machinery.
Brown Holsting & Conveying Machine Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.

Copper.
Anes Sword Co., Chicopee, Mass.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.

Hendricks Bros., 49 Cliff, N. Y.
New Haven Copper Co., 294 Pearl, N. Y.
Randolph & Clowes, Waterbury, Conn.
Rome Brass & Copper Co., Rome, N. Y.
Wister, Francis, Philadelphia, Pa.

Copper Sheet.
Cramp Metal Mfg. Co., Olney, Phila., Pa.

Cordage.
Samson Cordage Works, Boston, Mass.

Cork Screws.
Williamson, C. T. Wire Novelty Co., Newark, N. J.

Corrugated Furnaces.
Continental Iron Wks., Brooklyn, N. Y.

Corrugated Iron.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
Moseley Iron Bridge & Roof Co., 5 Day, N. Y.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

Counting Machines.
Durant, W. N., Milwaukee, Wis.

Cranes.
Maris & Beekley, Philadelphia, Pa.
Ridgway, Craig & Sons, Coatesville, Pa.
Sellers, Wm. & Co., Inc., Phila., Pa.
Whiting Foundry Equipment Co., Chicago, Ill.
Yale & Towne Mfg. Co., Stamford, Conn.

Culverts.
Nichols, W. A., Philadelphia, Pa.

Cupolas, Hot Blast.
Whiting Foundry Equipment Co., Chicago, Ill.

Curry Combs.
Graham, Jno. H. & Co., 113 Chambers St., N. Y.

Cutlery, Importers of.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Cutlery, Manufacturers of.
Bingham, W. Co., Cleveland, Ohio.
Dane, Stoddard & Kendall, Boston, Mass.
Goodell Co., Antrim, N. H.
Northampton Cutlery Co., Northampton, Mass.
Supplee Hdw. Co., Phila., Pa.
Wilson, John, Sheffield, England.

Cutlery Display Cases.
Union Show Case Co., Chicago, Ill.

Dampers.
Arcade Mfg. Co., Freeport, Ill.

Dies.
Wilson, J. Fred, Worcester, Mass.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Dish Washers.
Boigiano Mfg. Co., Baltimore, Md.

Dog Collars.
Union Hardware Co., Torrington, Ct.

Door Checks and Springs.
Bardsley, J., 149 & 151 Baxter St., N. Y.
Blount Mfg. Co., Boston, Mass.

Door Latches.
Thomas, W. H., Jenkintown, Pa.

Drilling Machines.
Beaman & Smith, Providence, R. I.
Bickford Drill & Tool Co., Cin., Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Dallett, Thos. H. & Co., Philadelphia.
D'Amour & Littledale 204 E. 43d St., N. Y.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Dwight Slate Machine Co., Hartford, Conn.

Goddard, Asa, Worcester, Mass.
Halsey, Jas. T., Philadelphia, Pa.
Hamilton Mch. Tool Co., Hamilton, O.
Herrick & Cowell, New Haven, Conn.
Quint, A. D., Hartford, Conn.
Sellers, Wm. & Co., Inc., Phila., Pa.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Willey & Russell Mfg. Co., Greenfield, Mass.
Woodward & Rogers, Hartford, Conn.

Drop Forgings.
Billings & Spencer Co., Hartford, Conn.
Boone, W. C. Mfg. Co., Bounton, N. J.
Clapp, E. D. Mfg. Co., Auburn, N. Y.
Eccles, Richard, Auburn, N. Y.
Merrill Bros., Brooklyn, E. D.
R. I. Tool Co., Providence, R. I.
Scranton Forging Co., Scranton, Pa.
Wilcox & Howe Co., Birmingham, Conn.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Wyman & Gordon, Worcester, Mass.

Drop Presses.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Ferracute Mch. Co., Bridgeton, N. J.
Miner & Peck Mfg. Co., New Haven, Conn.
Stiles & Parker Press Co., Brooklyn, N. Y.
Vulcan Iron Works, Chicago, Ill.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Dumb Walters.
Hutchinson, F. S. Co., 32 Warren Street, N. Y.
Storm Mfg. Co., Newark, N. J.

Dynamite.
New York Powder Co., 62 Liberty St., N. Y.

Dynamos.
C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
Cutter, Wood & Stevens, Boston, Mass.
Zucker & Levett & Loeb Co., 10 to 14 Grand St., N. Y.

Edge Tools, Makers of.
Buck Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.
Plumb, Fayette R., Philadelphia, Pa.
White, L. & I. J. Co., Buffalo, N. Y.

See Alphabetical Index, Pages 105 & 106.

Egg Beaters.

North Bros. Mfg. Co., Philadelphia, Pa.
Electric Bells and Supplies.
 Ostrander, W. R. & Co., 204 Fulton St., New York.
 Wollensak, J. F., Chicago, Ill.

Electric Dynamo Machines.

Hanson & Van Winkle Co., Newark, N. J.

Electric Lights.

Electric Construction & Supply Co., 18 Cortlandt St., N. Y.

Elevators, Makers of.

Link-Belt Engineering Co., Phila., Pa.
 Morse, Williams & Co., Phila., Pa.
 Fenna, Elevator Engineering Co., Phila., Pa.
 Warner Elevator Mfg. Co., Cincinnati, Ohio.

Emery and Emery Wheels.

Cutter, Wood & Stevens, Boston, Mass.
 Diamond Mach. Co., Providence, R. I.
 N. Y. Belting & Packing Co., Ltd., N. Y.
 Northampton Emery Wheel Co., Leeds, Mass.
 Norton Emery Wheel Co., Worcester, Mass.
 Sterling Emery Wheel Co., 174 Fulton St., N. Y.
 Tanite Co., Stroudsburg, Pa.

Emery Wheel Dressers.

Bay State Stamping Co., Worcester, Mass.

Engineers and Contractors.

Aiken, Henry, Pittsburgh, Pa.
 Herrick, J. A., 284 Pearl St., N. Y.
 Kennedy, Julian, Pittsburgh, Pa.
 Laughlin, Alex. & Co., Pittsburgh, Pa.
 Lean, D. R., Co., Pittsburgh, Pa.
 McClure, Amsler & Co., Pittsburgh, Pa.
 Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.
 Swindell, W. & Bros., Pittsburgh, Pa.
Engines, Gas and Gasoline.
 Buckeye Mfg. Co., Union City, Ind.
 Otto Gas Engine Works, Phila., Pa.
 Springfield Gas Engine Co., Springfield, Ohio.
 Sumner, H. W., Covington, Ky.

Engines, Steam, Makers of.

Allis, E. P. Co., Milwaukee, Wis.
 Bass Foundry & Machine Works, Ft. Wayne, Ind.
 Chandler & Taylor Co., Indianapolis, Ind.
 Harris, Wm. A., Steam Engine Co., Providence, R. I.
 Lane & Bodley Co., Cincinnati, Ohio.
 Norwalk Iron Works Co., So. Norwalk, Conn.
 Phila. Engineering Works, Phila., Pa.
 Southwark Foundry & Machine Co., Phila., Pa.
 Tod, William & Co., Youngstown, O.
 Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
 Westwick, Jno. & Son, Galena, Ill.
 Wetherill, Robt. & Co., Chester, Pa.

Exercise.

Independent Electric Co., Chicago, Ill.

Expansion Bolts.

Boone, W. C. Mfg. Co., Boonton, N. J.
 Church, Isaac, Toledo, O.
 Steward & Romaine Mfg. Co., Phila., Pa.

Exporters.

Flint & Co., 68 Broad St., N. Y.

Faucets, Self-Measuring.

Lane Bros., Poughkeepsie, N. Y.

Faucets, Wooden, Makers of.

John Sommer's Son, Newark, N. J.

Feed-Water Heaters and Purifiers.

Davis, I. B. & Son, Hartford, Conn.
 Harrison Safety Boiler Works, Phila., Pa.
 National Pipe Bending Co., New Haven, Conn.
 Taunton Locomotive Mfg. Co., Taunton, Mass.
 Webster, Warren & Co., Camden, N. J.
 Whitlock Coil Pipe Co., Elmwood, Conn.

Fence Ratchets.

Wire Fence Supply Co., Indianapolis, Ind.

Fencing, Iron and Wire.

Barnum, E. T., Detroit, Mich.
 Champion Iron Co., Kenton, O.
 Chess Bros., Pittsburgh, Pa.
 Clinton Wire Cloth Co., Clinton, Mass.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., Kilmear, Mfg. Co., Newburgh, N. Y.
 McCallip Fence & Wire Wks., Columbus, Ohio.
 The Van Dorn Iron Works Co., Cleveland, O.

Files, Importers of.

Moss, F. W., 80 John St., N. Y.

Files and Rasps, Manufacturers of.

Arcade File Works, Anderson, Ind.
 Banker & White, Troy, N. Y.
 Barnett, G. & H., 41 & 43 Richmond, Phila.
 McCaffrey File Co., Philadelphia.
 Nicholson File Co., Providence, R. I.
 Supplee Hardware Co., Phila., Pa.

Fire Brick, Makers of.

Borkner, Cyrus, Philadelphia, Pa.
 Gardner, Jas. & Son, Cumberland, Md.
 Kreisler, B. & Sons, foot E. Houston St., N. Y.
 Maurer, H. & Son, 420 E. 23d, N. Y.
 Ostrander Fire Brick Co., Troy, N. Y.
 Valentine, M. D. & Bro. Co., Woodbridge.

Fire Doors.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.

Fishing Tackle.

Dame, Stoddard & Kendall, Boston, Mass.

Flint and Emery Paper.

Baeder, Adamson & Co., Phila., Pa.

Flour Sifters.

Meyers, Fred, J. Mfg. Co., Hamilton, O.

Fodder Cutters.

Silver Mfg. Co., Salem, O.

Forges, Portable, &c.

Buffalo Forge Co., Buffalo, N. Y.
 Champion Blower & Forge Co., Lancaster, Pa.
 Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel.

Bethlehem Iron Co., S. Bethlehem, Pa.
 Cambria Steel—Cambria Iron Co., Johnstown, Pa.
 Frankford Steel Co., Phila., Pa.
 Scranton Forging Co., Scranton, Pa.
 U. S. Projectile Co., Brooklyn, N. Y.

Forks, Hay and Manure.

Withington & Cooley Mfg. Co., Jackson, Mich.

Foundry Facings.

Dixon, Jos., Crucible Co., Jersey City, N. J.
 S. Obermayer Co., Cincinnati, O.
 Smith's Pattern Works, Akron, Ohio.

Foundry Riddles.

Estey, W. S., 65 Fulton, N. Y.

Foundry Supplies.

S. Obermayer Co., Cincinnati, O.
 Rice Mfg. Co., New Durham, N. H.
 Smith, J. D., Fdy. Supply Co., Cin., O.
 Smith's Pattern Works, Akron, Ohio.

Friction Clutches.

Brown, A. & F., 17 Day St., N. Y.
 Keystone Clutch & Mch. Wks., Phila., Pa.
 Moore & White Co., Philadelphia, Pa.

Galvanized Material.

Jersey City Galvanizing Co., 112 John St., N. Y.

Galvanizing and Tinning.

Wilcox, Crittenden & Co., Middletown, Conn.

Gas Producers.

Wood, R. D. & Co., Philadelphia, Pa.

Gas Stoves.

Bolgiano Mfg. Co., Baltimore, Md.

Gas & Steam Fitters' Supplies.

Leavitt Mch. Co., Orange, Mass.
 Fancoast, Henry B. & Co., Phila., Pa.

Gate Hinges.

Wrightsville Hdw. Co., Wrightsville, Pa.

Gear Cutters.

D. E. Whiton Mach. Co., New London, Conn.

Gears.

Boston Gear Works, Boston, Mass.
 Gleason Tool Co., Rochester, N. Y.
 Lincoln Iron Works, Rutland, Vt.
 Poole, Robt. & Son Co., Baltimore, Md.
 U. S. Projectile Co., Brooklyn, N. Y.

Glass Boards.

Larkin Rule Co., Saginaw, Mich.

Glass Cutters.

Monce, S. G., Bristol, Conn.

Glaziers' Points.

Shelton Co., Birmingham, Conn.

Glue.

Baeder, Adamson & Co., Phila., Pa.
 Dodd, A. W. & Co., Gloucester, Mass.
 Russia Cement Co., Gloucester, Mass.

Grate Guards.

Dow Wire Works Co., Louisville, Ky.

Grinding and Polishing Machines.

Cutter, Wood & Stevens, Boston, Mass.
 Diamond Mach. Co., Providence, R. I.
 Herrick & Cowell, New Haven, Conn.
 Norton Emery Wheel Co., Worcester, Mass.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stove Co., Cleveland, O.

Gun Implements.

Bridgeport Gun Implement Co., 318-315 Broadway, N. Y.
 Union Hdw. Co., Torrington, Conn.

Gunpowder, Makers of.

Lafin & Rand Powder Co., 29 Murray St., N. Y.

Gymnasium Supplies.

Independent Electric Co., Chicago, Ill.

Handles.

Cleveland Wood Turning Co., Cleveland, O.

Hangers, Door.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.
 Lane Bros., Poughkeepsie, N. Y.

Hardware Comm'n Merchants.

Jacobus, W. H., 90 Chambers, N. Y.

Hardware Drawers.

Wernicke Co., Minneapolis, Minn.

Hardware Jobbers.

White, Van Glahn & Co., 15-17 Chat-ham Square, N. Y.

Hardware Manufacturers.

Allentown Hardware Works, Allentown, Pa.
 Miller Falls Co., 93 Reade St., N. Y.
 Stearns, E. C. & Co., Syracuse, N. Y.
 Streeter, N. R. & Co., Groton, N. Y.
 Supplee Hdw. Co., Phila., Pa.
 Union Mfg. Co., 105 Chambers, N. Y.
 Yale & Towne Mfg. Co., Stamford, Conn.

Hardware Mrs. Agents.

Bingham, W. Co., Cleveland, O.
 Clarke, Thomas, St. John, N. B.
 Graham, John H. & Co., 113 Chambers.
 Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.
 Barker Bros., Philadelphia, Pa.
 Clark Mfg. Co., Buffalo, N. Y.
 Enterprise Mfg. Co., Philadelphia, Pa.
 Ete & Henger Mfg. Co., St. Louis, Mo.
 Gwinner Mfg. Co., Hamilton, O.
 Johnson, S. C., Racine, Wis.
 New Britain Hdw. Mfg. Co., New Britain, Conn.
 North Bros. Mfg. Co., Philadelphia, Pa.
 Scranton & Co., New Haven, Conn.
 Union Lock & Hdw. Co., Lancaster, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wrightsville Hdw. Co., Wrightsville, Pa.

Harness Snaps.

Covert Mfg. Co., West Troy, N. Y.
 Coverts' Saddlery Wks., Farmer, N. Y.
 Fitch, W. & E. T., New Haven, Conn.

Hay Tools.

Myers, F. E. & Bro., Ashland, O.

Hoes.

Withington & Cooley Mfg. Co., Jackson, Mich.

Hoisting Machines.

Box, Alfred & Co., 314 Green, Phila.
 Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.
 Byers, Jno. F. Mch. Co., Ravenna, O.
 Fulton Iron & Engine Wks., Detroit, Mich.
 Harrington, E. Son & Co., Phila.
 Ridgewood Mfg. Co., 96 Liberty, N. Y.
 Lincoln Iron Works, Rutland, Vt.
 McCoy, Jos. F. Co., 26 Warren St.
 Marks & Beekley, Philadelphia.
 Moore Mfg. & Fdy. Co., Milwaukee, Wis.
 Morse, Williams & Co., Phila.
 Sellers, Wm. & Co., Phila. and N. Y.
 Speldel, J. G., Reading, Pa.
 Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Avery Stamping Co., Cleveland, O.
 Brown Supply Co., Cleveland, Ohio.
 Cleveland Stamping & Tool Co., Cleveland, O.

Hollow Ware, Aluminum.

Wohler Aluminum Co., Chicago, Ill.

Horse Clippers.

Gillette Clipping Machine Co., 201 E. 23d St., N. Y.

Horse Nails, Makers of.

Capewell Horse Nail Co., Hartford, Conn.
 National Horse Nail Co., Vergennes, Mass.
 Putnam Nail Co., Neponset, Boston, Mass.

Horse and Mule Shoes, Makers of.

Bryden Horse Shoe Co., Catsaqua, Pa.
 Burden Iron Co., Troy, N. Y.
 Crescent Horse Shoe & Iron Co., Max Meadows, Va.
 Leonard, J., 448 West St., N. Y.
 Old Dominion Iron & Nail Works Co., Richmond, Va.
 Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
 Rhode Island Perkins Horse Shoe Co., Providence.
 Shoenberger & Co., Pittsburgh, Pa.
 Standard Horse Shoe Co., Boston, Mass.

Hose.

N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

Hydrants, &c.

McLean, John, 296 & 298 Monroe, N. Y.

Hydraulic Forging.

U. S. Projectile Co., Brooklyn, N. Y.

Hydraulic Jacks.

Dudgeon, Richard, 24 Columbia, N. Y.
 McCoy, Jos. F. Co., 26 Warren St., N. Y.

Ice Cream Freezers.

White Mountain Freezer Co., Nashua, N. H.
 Sayre, L. A., Newark, N. J.

Injectors.

Eynon-Evans Mfg. Co., Philadelphia, Pa.
 Jenkins Bros., New York.
 Sherwood Mfg. Co., Buffalo, N. Y.

Insurance, Boiler.

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.

Lundberg, Gustaf, Boston, Mass.
 Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Butze, Adolph, St. Louis, Mo.
 Corning, Edw. & Co., 29 B'way, N. Y.
 Cotton, Barclay W. & Co., Phila.
 Eting, Edw. J., Philadelphia.
 Hogan, John H. & Co., Philadelphia, Pa.
 Hoffman, J. W. & Co., Philadelphia.
 Levis, Henry & Co., Philadelphia.
 Keeley, Jerome & Co., Philadelphia.
 Lea, J. Tattall & Co., Philadelphia.
 Mohr, J. J., 430 Walnut, Philadelphia.
 Pilling & Crane, Philadelphia, Pa.
 Wister, L. & R. Co., Phila., Pa.

Iron Ore.

Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barns, C. K. & Co., Philadelphia, Pa.
 Borden & Lovell, 70 West, N. Y.
 Corning, Edw. & Co., 20 B'way, N. Y.
 Cox, Justice, Jr., Philadelphia.
 Cotton, Barclay W. & Co., Phila.
 Cunliffe, R. M., Phila., Pa.
 Hoffman, J. W. & Co., Philadelphia.
 Leonard, J., 448 West St., N. Y.
 Nicolls, Wheeler & Co., Philadelphia.
 Ogden & Wallace, 577 to 583 Greenwich St., N. Y.

Pierson & Co., 29 Broadway, N. Y.
 Thomson, W. H. & Co., Phila., Pa.
 Wallace, Wm. H. & Co., 68 B'way, N. Y.
 Whitney, R. & Co., 37 B'way, N. Y.
 Wilson, E. H. & Co., Philadelphia.

Iron, Importers.

Abbott, Wheelock & Co., N. Y. and Boston.
 Lundberg, Gustaf, Boston, Mass.

Iron, Sheet, Manufacturers of.

Cambridge Iron & Steel Co., Cambridge, Ohio.
 W. Dewes Wood Co., Lim., McKeesport, Pa.

Ironwork, Ornamental.

Barnum, E. T., Detroit, Mich.
 Champion Iron Co., Kenton, O.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 The Van Dorn Iron Works Co., Cleveland, O.

Japanning.

Smith, Theo. V., 54 John St., N. Y.

Keys.

Wollensak, J. F., Chicago, Ill.

Knife and Tool Grinders.

Tracy, A. J. Co., Ltd., 18 Cliff St., N. Y.

Ladles.

Whiting Fdy. Equipment Co., Chicago, Ill.

Lanterns.

Buhl Stamping Co., Detroit, Mich.
 Steam Gauge & Lantern Co., Syracuse, N. Y.

Lasts.

Kupferle, Jno. C., St. Louis, Mo.

Lathes.

Bear & Smith, Providence, R. I.
 Dietz, Schumacher & Co., Cincinnati, O.
 Draper Machine Tool Co., Worcester, Mass.
 Harrington, E. Son & Co., Phila.
 Johnson, Israel H. Jr., & Co. P. delphia, Pa.
 New Haven Mfg. Co., New Haven, Conn.
 Sebastian Lathe Co., Cincinnati, O.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Lathing, Expanded Metal.

Chess Bros., Pittsburgh, Pa.

Lathing, Wire.

Clinton Wire Cloth Co., Clinton, Mass.
 N. J. Wire Cloth Co., Trenton, N. J.
 Wright & Colton Wire Cloth Co., Worcester, Mass.

Laundry Machines.

Cudlipp, Thos. & Co., London, Eng.

Lawn Mowers.

Anderson, F. S. & Co., Richmond, Ind.
 Blair Mfg. Co., Springfield, Mass.
 Chadborn & Coldwell Mfg. Co., Newburg, N. Y.
 Coldwell Lawn Mower Co., Newburg, N. Y.
 Dille & McGuire Mfg. Co., Richmond, Ind.
 F. & N. Mfg. Co., Richmond, Ind.
 Henley, M. C., Richmond, Ind.

Lawn Rakes.

Gibbs Mfg. Co., Canton, Ohio.
 Kohler, F. E. & Co., Canton, O.

Lawn Sprinklers.

Blair Mfg. Co., Springfield, Mass.
 Ete & Henger Mfg. Co., St. Louis, Mo.
 McGowan, John H. Co., Cincinnati, O.

Letters and Figures, Metallic.

White, A. A. & Co., Providence, R. I.

Letters, Paper.

Tablet & Ticket Co., Chicago, Ill.

Levels.

Richardson, C. F. & Son, Athol, Mass.

Locks and Knobs, Manufacturers of.

Deitz, A. E., 97 Chambers, N. Y.
 Reading Hdw. Co., Reading, Pa.
 Smith & Egge Mfg. Co., Bridgeport, Conn.
 Warner Lock Co., Chicago, Ill.
 Yale & Towne Mfg. Co., Stamford, Conn.

Lubricants.

Dixon, Jos., Crucible Co., Jersey City, N. J.

Machinery.

Am. Tool Works, Cleveland, Ohio.
 Ayer, H. C. & Gleason Co., Phila., Pa.
 Barnes, W. F. & John, Rockford, Ill.
 Beaman & Smith, Providence, R. I.
 Bement, Miles & Co., Philadelphia, Pa.
 Bigelow, C. E., 45 Day,

- Place, Geo., 145 Broadway, N. Y.
 Pond, L. W. Mch. Co., Worcester, Mass.
 Poole, Robt. & Son Co., Baltimore, Md.
 Powell Planer Co., Worcester, Mass.
 Prentiss Tool & Supply Co., N. Y.
 Scranton Supply & Mchry. Co., Scranton, Pa.
 Sellers, Wm. & Co., Phila.
 Seyfert's Sons, L. E., Philadelphia, Pa.
 Sigourney Tool Co., Hartford, Conn.
 Steptoe, J. & Co., Cincinnati, O.
 Stow Flexible Shaft Co., Ltd., Phila.
 Toomey, Frank, Philadelphia, Pa.
 Walker Mfg. Co., Cleveland, O.
 Wetherill, Robert & Co., Chester, Pa.
 Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**
 Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**
 Loring, Coes & Co., Worcester, Mass.
 Simonds Mfg. Co., Fitchburg, Mass.
- Machine Screws.**
 American Iron & Bolt Co., Cincinnati, Ohio.
 Rubbell, Harvey, Bridgeport, Ct.
 New Britain Hdw. Mfg. Co., New Britain, Conn.
 Phila. Mach. Screw Works, Phila., Pa.
 Rhode Island Tool Co., Providence, R. I.
- Machine Tools.—See Machinery.**
- Machine Work.**
 Papping, J., 68th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**
 Coffin & Leighton, Syracuse, N. Y.
 Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
 King, J. M. & Co., Watford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.
- Manufacturing Sites.**
 Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.
- Measuring Tapes.**
 Lufkin Rule Co., Saginaw, Mich.
- Meat Choppers.**
 Enterprise Mfg. Co., Philadelphia, Pa.
- Meat Cutters.**
 North Bros. Mfg. Co., Philadelphia, Pa.
- Mechanical Instruction.**
 Correspondence School of Mechanics, Scranton, Pa.
- Metals.**
 Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**
 American Metal Co., N. Y.
- Metal Saws.**
 Q. & C. Co., Chicago, Ill.
- Metallurgists.**
 Britton, J. Blodgett, Phila., Pa.
- Mining Knives.**
 Palmer Hdw. Mfg. Co., Troy, N. Y.
 Streeter, N. R. & Co., Groton, N. Y.
- Mine Lamps.**
 Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
- Mining Screens.**
 Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton, N. Y.
- Mining Machinery.**
 Allis, E. P. Co., Milwaukee, Wis.
- Models, Makers of.**
 Ideal Machine Works, Hartford, Conn.
- Molding Sand.**
 Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**
 Bolgiano Mfg. Co., Baltimore, Md.
 C. & C. Electric Co., 402 and 404 C. Greenw. St., N. Y.
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Keg Stock.**
 Crescent Mfg. Co., Detroit, Mich.
- Nail Machinery.**
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**
 Am. Specialty Co., Hartford, Conn.
 Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**
 Borden & Lovell, 70 West, N. Y.
 Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
- Nickel Platers' Supplies.**
 Hanson & Van Winkle Co., Newark, N. J.
 Zucker & Levent & Loeb Co., 10 to 14 Grand St., N. Y.
- Norway Shapes, Rollers of.**
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**
 Ideal Machine Works, Hartford, Conn.
- Nut Machines.**
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
 American Bolt Co., Lowell, Mass.
 American Iron & Bolt Co., Cincinnati, Ohio.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Conn.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.
 Port Chester Bolt & Nut Co., Port Chester, N. Y.
 Rhode Island Tool Co., Providence, R. I.
 Russell, Burdall & Ward, Port Chester, N. Y.
 Sternbergh, J. H. & Son, Reading, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.
- Oil Cups and Lubricators.**
 Sherwood Mfg. Co., Buffalo, N. Y.
- Oilers.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oil Heaters.**
 Parker, Chas. Co., Meriden, Conn.
- Oilless Anti-Friction Metals.**
 North American Metalline Co., Long Island City, N. Y.
- Oil Stones.**
 Pike Mfg. Co., Pike Station, N. H.
- Ores.**
 Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**
 Scranton Forging Co., Scranton, Pa.
- Packing.**
 Morrison, Robert, St. Louis, Mo.
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**
 Ames Sword Co., Chicopee, Mass.
 Fraim, E. T., Lancaster, Pa.
 Union Lock & Hdw. Co., Lancaster, Pa.
 Wolf, W. & L., Phila., Pa.
- Pails.**
 Richmond Cedar Wks., Richmond, Va.
- Paint Burners.**
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
 Butler, C. N., Phila., Pa.
 Jenner, H. W. T., Washington, D. C.
 Howson & Howson, Philadelphia and Washington
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**
 Wells, Heber, 157 William St., N. Y.
- Perforated Metal.**
 Clifton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**
 Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**
 Plumb, Fayette R., Philadelphia, Pa.
- Pig Iron.**
 Houston, C. B. & Co., Philadelphia, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Pilling & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
 Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**
 Armstrong Mfg. Co., Bridgeport, Conn.
 Bignall & Keeler Mfg. Co., St. Louis, Mo.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Merrill Mfg. Co., Toledo, O.
 Pencoast, Henry B. & Co., Phila.
 Saunders' Sons, D., Yonkers, N. Y.
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Sewer.**
 Columbus Sewer Pipe Co., Columbus, Ohio
- Pipe, Water and Gas, Makers of.**
 Donaldson Iron Co., Emaus, Pa.
 Riverside Iron Works, Wheeling, W. Va.
 Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**
 Buck Bros., Millbury, Mass.
 Buck, Chas., Millbury, Mass.
- Planers.**
 Detrick & Harvey Mch. Co., Baltimore, Md.
 New Haven Mfg. Co., New Haven, Conn.
 Pond, L. W. Mch. Co., Worcester, Mass.
 Powell Planer Co., Worcester, Mass.
 Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**
 Stanley Rule & Level Co., N. Y.
- Plated Ware.**
 Boardman, L. & Son, New Haddam, Ct.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**
 Atlas Standard Iron & Steel Co., Bridgeport, O.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, Ohio.
 Moorhead-McLean Co., Pittsburgh, Pa.
 Molvahn & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Iron & Steel Co., Pottsville, Pa.
 Singer, Nimblek & Co., Pittsburgh, Pa.
 The Mahoning Valley Iron Co., Youngstown, O.
 Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**
 Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**
 Gibbs Mfg. Co., Canton, Ohio.
 Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**
 Barnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 "Silver Finish."
 Tyler Wire Works Co., W. S., Cleveland, O.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
 Laffin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.
- Power Hammers.**
 Diemel & Eisenhardt, Philadelphia.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Jenkins & Lurie, Bellefonte, Pa.
 Long & Allstatter Co., Hamilton, Ohio
 Miner & Peck Mfg. Co., New Haven, Conn.
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Ferracute Mch. Co., Bridgeport, N. J.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury, Ct.
- Presses, Power, Makers of.**
 Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Merriman, A. H., Meriden, Conn.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Printing and Embossing.**
 Griffith, Axtell & Cady Co., Holyoke, Mass.
- Pruning Shears.**
 Clyde Cutlery Co., Clyde, O.
 Topfitt & Ely Co., Elyria, Ohio.
- Pulleys.**
 Brown, A. & F., 17 Dey St., N. Y.
 Dodge Mfg. Co., Mishawaka, Ind.
 Keystone Clutch Mch. Wks., Phila., Pa.
 Reading Wood Pulley Co., Reading, Pa.
 Reeves Pulley Co., Columbus, Ind.
- Pumping Machinery.**
 Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Hooker-Golville Steam Pump Co., St. Louis, Mo.
 Lucas, C. O. & Co., Greenville, Ohio.
 McGowan, J. H. & Co., Cincinnati, O.
 Maslin, J. & Son, Jersey City, N. J.
 Norwalk Iron Works Co., So. Norwalk, Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Works, Easthampton, Mass.
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pump Leathers.**
 Detroit Valve & Washer Co., Detroit, Mich.
- Pumps, Makers of.**
 Liming Co., Salem, O.
 Douglas, W. & B., Middletown, Conn.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Myers, F. E. & Bro., Ashland, O.
 Peters Pump Co., Kewanee, Ill.
- Punches.**
 Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Butts & Ordway, Boston, Mass.
 Crosby, G. A. & Co., Chicago, Ill.
 Ferracute Mch. Co., Bridgeport, N. J.
 Long & Allstatter Co., Hamilton, Ohio.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Wais & Roos Punch & Shear Co., Cincinnati, Ohio.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
 Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
 Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**
 Burditt & Williams, Boston, Mass.
 Estey, W. S., 65 Fulton, N. Y.
 Erclesior Cutlery Co., Worcester, Mass.
- Razors, Manufacturers of.**
 Millbury Razor Co., Millbury, Mass.
 Sordish Razor Co., Worcester, Mass.
- Re-Seating Machines.**
 Leavitt Mch. Co., Orange, Mass.
- Reducing Valves.**
 D'Este & Seeley Co., Boston, Mass.
- Keels.**
 Hendryx, A. B. Co., New Haven, Conn.
- Refrigerators.**
 Wisconsin Refrigerator Co., Eau Claire, Wis.
- Rivers.**
 Blake & Johnson, Waterbury, Conn.
 Burrington Iron Co., Troy, N. Y.
 Clark & Cowles, Plainville, Conn.
 Cobb & Drew, Plymouth, Mass.
 Sternbergh, J. H. & Son, Reading, Pa.
 Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**
 Adt, Jno. & Sons, New Haven, Conn.
- Rolling Mill Machinery.**
 Birmingham Iron Fdry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 Leeburg Foundry & Mch. Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 Robinson-Rea Mfg. Co., Pittsburgh.
 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
 Trethewey Mfg. Co., Pittsburgh, Pa.
 Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Rolls, Chilled, Sand and Steel.**
 Birmingham Iron Foundry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 East Chicago Fdry Co., Chicago, Ill.
 Garrison, A. Fdry. Co., Pittsburgh, Pa.
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.
 Seaman, Sleeth & Black, Pittsburgh.
 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
- Roofing.**
 Cincinnati Corrugating Co., Piqua, O.
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**
 Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
 Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
 Stanley Rule & Level Co., 29 Chambers, Stephens & Co., Riverton, Conn.
- Sad Irons.**
 Enterprise Mfg. Co., Phila., Pa.
 Streeter, N. R. & Co., Groton, N. Y.
- Sad Irons, Gas.**
 Bolgiano Mfg. Co., Baltimore, Md.
- Sand Paper.**
 Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
 Caldwell Mfg. Co., Rochester, N. Y.
 Fullman Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains.**
 Morton, Thos., 65 Elizabeth, N. Y.
 Samson Cordage Works, Boston, Mass.
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Locks.**
 Champion Safety Lock Co., Cleveland, Ohio
- Sash Pulleys.**
 Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
 Brown, E. E. & Co., Philadelphia, Pa.
 Kings County Iron Foundry, Brooklyn, N. Y.
 Norton Bros., Chicago, Ill.
- Saw Filing Machines.**
 Diston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**
 Atkins, E. C. & Co., Indianapolis, Ind.
 Butler Mfg. Co., Boston, Mass.
 Diston, Henry & Sons, Phila., Pa.
 National Saw Co., Newark, N. J.
 Simonds Mfg. Co., Fitchburg, Mass.
- Saw Sets.**
 Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Saw Vises.**
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Sawing Machines.**
 Q. & C. Co., Chicago, Ill.
- Scales, Manufacturers of.**
 Buffalo Scale Co., Buffalo, N. Y.
 Chatillon, John & Sons, 85-89 Cliff, N. Y.
 Standard Scale & Fixtures Co., St. Louis, Mo.
- Scrapers, Road.**
 Sidney Road Scraper Co., Sidney, O.
- Screens, Coal and Ore.**
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screw Cutting Machinery.**
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
 Brown, R. H. & Co., New Haven, Conn.
 Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Machinery.**
 Hartford Machine Screw Co., Hartford, Conn.
- Screw Plate and Pipe Cutter.**
 Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Wm. H. Haskell Co., Pawtucket.
 Miles, F. S., 205 Quarry, Philadelphia.
 Reynolds & Co., New Haven, Conn.
 Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**
 Barnes, W. F. & John, Rockford, Ill.
 Millers Falls Co., 93 Reade St., N. Y.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Seythe Stones and Whetstones.**
 Pike Mfg. Co., Pike Stat'n, N. H.
 Cleveland Stone Co., Cleveland, O.
- Shafting, Makers of.**
 Brown, A. & F., 17 Dey St., N. Y.
 Cresson, Geo. V. Co., Philadelphia, Pa.
 Fairmount Mch. Co., Philadelphia, Pa.
 Sellers, Wm. & Co., Inc., Phila., Pa.
 Stow Mfg. Co., Binghamton, N. Y.
- Shaped Iron and Steel, Manufacturers of.**
 Etna-Standard Iron & Steel Co., Bridgeport, O.
 East Chicago Fdry Co., Chicago, Ill.

- Allentown Rolling Mill.** Allentown, Pa. Lockhart Iron & Steel Co., Pittsburgh, Pa.
- Passaic Rolling Mill Co.** Paterson, N.J. The Phoenix Iron Co., Phila., Pa. Pottsville Iron & Steel Co., Pottsville, Pa.
- Roberts, A. & P. & Co.** Phila., Pa. Tudor Iron Works, St. Louis, Mo.
- Shears and Scissors.** Acme Shear Co., Bridgeport, Conn. Clauss Shear Co., Fremont, Ohio. Heinischs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.** Aetna-Standard Iron and Steel Co., Bridgeport, O. Cambridge Iron & Steel Co., Cambridge, Ohio. Jersey City Galvanizing Co., 112 John St., N. Y. Mahoning Valley Iron Co., Livingston, Ohio. Morehead-McCleane Co., Pittsburgh. Pierson & Co., 29 Broadway, N. Y. Singer, Nimick & Co., Ltd., Pittsburgh, Pa. The Mahoning Valley Iron Co., Youngstown, O. Alan Wood Co., Philadelphia. W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc.** Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.** Atlas Mfg. Co., New Haven, Conn. Stanley Works, New Britain, Conn.
- Shoe Stands.** Kupferle, Jno. C., St. Louis, Mo.
- Shovels.** Peninsular Metal Works, Detroit, Mich.
- Show Cases.** Union Show Case Co., Chicago, Ill.
- Sinks.** Douglas, W. & B., Middletown, Conn.
- Skate Grinding Machinery.** Perkins, Chas., Bridgewater, Mass.
- Skates, Ice.** Barney & Berry, Springfield, Mass. Keene Mfg. Co., Keene, N. H. Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.** Henley, M. C., Richmond, Ind. Union Hardware Co., Torrington, Ct. Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Slag Machines.** Cambria Iron Co., Johnstown, Pa.
- Slaw Cutters.** Tucker & Dorsey Mfg. Co., Indianapolis, Ind.
- Smelting Works.** Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.** Clendenin Bros., Baltimore, Md. Covert Mfg. Co., West Troy, N. Y.
- Speaking Tubes.** Ostrander, W. R. & Co., 204 Fulton St., N. Y. Wollensak, J. F., Chicago, Ill.
- Special Machinery.** Rhodes, L. E. Co., Hartford, Conn.
- Spelter.** Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Spoons and Forks.** Boardman, L. & Son, New Haddam, Conn. Holmes & Edwards Silver Co., Bridgeport, Conn. Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.** Hartley & Graham, 313-315 B'way, N. Y.
- Springs.** Clark & Cowles, Plainville, Ct. Colled Wire Belting Co., Jersey City, N. J. Dunbar Bros., Bristol, Conn. Miller & Van Winkle, Brooklyn, N. Y. Morgan Spring Co., Worcester, Mass. Roland, Wm. & Harvey, Phila., Pa. Sabin Machine Co., Montpelier, Vt. Tuck Mfg. Co., Brockton, Mass. Washburn & Moen Mfg. Co., Worcester, Mass. Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.** Bommer Bros., Brooklyn, N. Y. Pullman Sash Balance Co., Rochester, N. Y. Stover Mfg. Co., Freeport, Ill. Van Wagoner & Williams Hdw. Co., 14 Warren St., N. Y.
- Stamping Works.** Avery Stamping Co., Cleveland, O. Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.** Cobb & Drew, Plymouth, Mass. Titchener, E. H. & Co., Binghamton, N. Y.
- Steam Gauges.** Bristol Co., Waterbury, Conn. Star Brass Mfg. Co., Boston, Mass.
- Steam Hammers, &c., Makers of.** Dietelt & Eisenhardt, Philadelphia. Dudgeon, Richard, 24 Columbia Street, N. Y. Trethewey Mfg. Co., Pittsburgh, Pa.
- Steam Heating & Oil Separators.** Webster, Warren & Co., Camden, N. J.
- Steam Separators.** Harrison Safety Boiler Wks., Phila., Pa. Webster, Warren & Co., Camden, N. J.
- Steam Specialties.** D'Este & Seelye Co., Boston, Mass. Lunkenheimer Co., Cincinnati, O.
- Steam Traps.** D'Este & Seelye Co., Boston, Mass.
- Steel, Cold Rolled Strip.** Superior Steel Co., Pittsburgh, Pa. Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabet.** Hoefig, C. W., 52 Fulton St., N. Y. Krogerud, W., 61 Fulton St., N. Y.
- Steel Importers.** Abbott, Wheelock & Co., N. Y. and Boston. Hobson, Francis, Seaman & Co., 97 John St., N. Y. Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y. Milne, A. & Co., 1 Broadway, N. Y. Newton & Shipman, 83 John, N. Y. Wetherell Bros., 93 Liberty St., N. Y. Whitney, A. R. & Co., B'way, N. Y. Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Steel (Mushet's Special).** Jones, B. M. & Co., Boston.
- Steel Manufacturers.** Aetna-Standard Iron & Steel Co., Bridgeport, O. Bethlehem Iron Co., S. Bethlehem, Pa. Boker, Hermann & Co., 103 Duane St. Carbon Steel Co., Pittsburgh, Pa. Chester Steel Castings Co., Phila., Pa. Chrome Steel Works, Brooklyn, N. Y. Crescent Steel Co., Pittsburgh, Pa. Frankford Steel Co., Philadelphia. Gautier Steel Department of Cambria Iron Co., Johnstown, Pa. Hobson, Francis, Seaman & Co., 97 John St., N. Y. Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y. Kayser, Ellison & Co., Sheffield, Eng. La Belle Steel Co., Pittsburgh, Pa. London Iron Co., Salisbury, Conn. Lukens Iron & Steel Co., Coatesville, Pa. Morehead-McCleane Co., Pittsburgh, Pa. Moss, F. W., 83 John, N. Y. Pottsville Iron and Steel Co., Pottsville, Pa. Bowland, Wm. & Harvey, Frankford, Philadelphia. Singer, Nimick & Co., Pittsburgh. Superior Steel Co., Pittsburgh, Pa. Wordlaw, S. & J. Sheffield, Eng. Wetherell Bros., 93 Liberty, N. Y. Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel, Manufacturers' Agents.** Barns, C. K. & Co., Philadelphia, Pa. Butze, Adolph, St. Louis, Mo. Corning, Edw. & Co., 29 B'way, N. Y. Lindsay, Jas. G. & Co., Phila., Pa. Pierson & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.** Bethlehem Iron Co., S. Bethlehem, Pa. Cambria Iron Co., Johnstown, Pa. Montour Iron & Steel Co., Danville, Pa. Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tool.** Frankford Steel Co., Philadelphia, Pa. Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y. Jones, B. M. & Co., Boston, Mass. La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders, Rolling.** Bicycle Step Ladder Co., Chicago, Ill. Coburn Trolley Track Mfg. Co., Holyoke, Mass. Croissant, M., Albany, N. Y.
- Stocks and Dies.** Armstrong Mfg. Co., Bridgeport, Conn. Billings & Spencer Co., Hartford, Conn. Butterfield & Co., Derby Line, Vt. Hart Mfg. Co., Cleveland, O. Oster Mfg. Co., Cleveland, O. Saunders' Sons, D., Yonkers, N. Y. Wells Bros. & Co., Greenfield, Mass. Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stone Saws and Planers.** Lincoln Iron Works, Rutland, Vt.
- Store Fixtures.** Wernicke Co., Minneapolis, Minn.
- Stove Linings.** Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles.** Cheney, S. & Son, Manlius, N. Y.
- Stove Trucks.** Gwiner Mfg. Co., Hamilton, Ohio. Tucker & Dorsey Mfg. Co., Indianapolis, Ind.
- Street Lamps.** Steam Gauge & Lantern Co., Syracuse, N. Y.
- Structural Iron Work.** Lindsay, Jas. G. & Co., Phila., Pa.
- Structural Tubing.** National Structural Tubing Co., Potter Bldg., N. Y.
- Sulphuric Acid.** Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.** Atlas Tack Corporation, Boston, Mass. Chess Bros., Pittsburgh, Pa. Clendenin Bros., Baltimore, Md. Cobb & Drew, Plymouth, Mass. Grand Crossing Tack Co., Grand Crossing, Ill. Shelton Co., Birmingham, Conn.
- Tack and Nail Machinery.** Kimball Bros. & Co., Brockton, Mass. Sweetser, W. A., Brockton, Mass.
- Taps and Dies.** Butterfield & Co., Derby Line, Vt. Carpenter, J. M., Tap & Die Co., Pawtucket, R. I. Manning, Maxwell & Moore, 111 Liberty St., N. Y. Wiley Bros. & Co., Greenfield, Mass. Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.** Riehle Bros. Testing Mach. Co., Philadelphia.
- Testing Machines.** Riehle Bros. Testing Mach. Co., Phila.
- Theatrical Hardware.** Wollensak, J. F., Chicago, Ill.
- Thill Springs.** Sabin Machine Co., Montpelier, Vt.
- Thrust Collars.** Gouverneur Mach. Co., Gouverneur, N. Y.
- Time Record.** Scattergood, H. W., Phila., Pa.
- Tin Plate Machinery.** Lloyd Booth Co., Youngstown, Ohio.
- Toe Calks, Steel.** Burke, P. F., Boston, Mass.
- Tool Chests.** Am. Tool Co., 200 W. Houston St., N. Y.
- Tool Holders.** Armstrong Bros. Tool Co., Chicago, Ill.
- Tools.** Brown, R. H. & Co., New Haven, Conn. Leavitt Mch. Co., Orange, Mass. Mayhew, H. H. Co., Shelburne Falls, Mass. Millers Falls Co., 93 Reade, N. Y. Richardson, C. F. & Son, Athol, Mass. Standard Tool Co., Athol, Mass. Stanley Rule & Level Co., 28 Chambers. Starrett, L. S., Athol, Mass. Stearns, E. C. & Co., Syracuse, N. Y. Stevens, J., Arms & Tool Co., Chicopee Falls, Mass. Tower & Lyon, 95 Chambers St., N. Y. Tuck Mfg. Co., Brockton, Mass.
- Tools, Blacksmith and Wheelwright.** Buffalo Forge Co., Buffalo, N. Y. Butts & Ordway, Boston, Mass. Champion Blower & Forge Co., Lancaster, Pa. Oster Mfg. Co., Cleveland, Ohio. Plumb, Fayette R., Philadelphia, Pa. Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'.** Saunders' Sons, D., Yonkers, N. Y.
- Torches, Oil and Gasoline.** Dangler Stove & Mfg. Co., Cleveland, O. Schneider & Trenkamp Co., Cleveland, Ohio.
- Transom Lifters.** Wollensak, J. F., Chicago, Ill.
- Tree Holders.** Allentown Hdw. Works, Allentown, Pa. Logan & Strowbridge Iron Co., New Brighton, Pa.
- Trucks, Manufacturers of.** Clark, G. P., Windsor Locks, Conn.
- Tubes, Seamless Drawn Copper.** Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y. Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.** Avery Stamping Co., Cleveland, O. Leng's, John S. Son & Co., 4 Fletcher St., New York. Shelby Steel Tube Co., Shelby, Ohio. U. S. Projectile Co., Brooklyn, N. Y.
- Tubing, Structural.** National Structural Tubing Co., Potter Bldg., N. Y.
- Tumbling Barrels.** Henderson Bros., Waterbury, Conn.
- Turnbuckles.** Cleveland City Forge & Iron Co., Cleveland, O. Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.** Cleveland Twist Drill Co., Cleveland. Morse Twist Drill & Machine Co., New Bedford, Mass. New Process Twist Drill Co., Taunton, Mass. Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.** Chapman Valve Mfg. Co., Boston. Eynon-Evans Mfg. Co., Philadelphia, Pa. Jenkins Bros., 71 John, N. Y. Lunkenheimer Co., Cincinnati, O. McNab & Harlin Mfg. Co., 56 John, N. Y.
- Ventilating Fans.** Buett & Smith Mfg. Co., Detroit, Mich. Perkins, B. F. & Son, Holyoke, Mass.
- Ventilator Appliances.** Howard & Morse, 16 Fulton St., N. Y.
- Vise Jaws.** Newark Moh. Tool Co., Newark, N. J.
- Vises.** Hollands Mfg. Co., Erie, Pa. Howard Iron Works, Buffalo, N. Y. Lewis Tool Co., 44 Barclay St., N. Y. Millers Falls Co., 93 Reade St., N. Y. Parker, Chas. Co., Meriden, Conn. Prentiss Vise Co., 44 Barclay, N. Y. Tower & Lyon, 95 Chambers St., N. Y.
- Wagon Jacks.** Covert Mfg. Co., West Troy, N. Y. Covert's Saddle Works, Farmer, N. Y.
- Washboards.** Olds Wagon Wks., Ft. Wayne, Ind.
- Washers.** Haskell, Wm. H. Co., Pawtucket, R. I. Milton Mfg. Co., Milton, Pa. Sternbergh, J. H. & Son, Reading, Pa.
- Washing Machines.** Olds Wagon Works, Ft. Wayne, Ind. Richmond Cedar Wks., Richmond, Va.
- Water Meters.** Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.** Poole, Robt. & Son Co., Baltimore, Md.
- Wheelbarrows.** Bryan Mfg. Co., Bryan, Ohio. Sidney Steel Scraper Co., Sidney, O. Thomas, G. W. & Co., Toledo, O. Withington & Cooley Mfg. Co., Jackson, Mich.
- Window Cord, Makers of.** Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.** Cincinnati Barb Wire Fence Co., Cincinnati, O. Gautier Steel Department of Cambria Iron Co., Johnstown, Pa. Miller & Van Winkle, Brooklyn, N. Y. New Castle Wire Nail Co., New Castle, Pa. New Haven Wire Mfg. Co., New Haven, Conn. Prentiss, Geo. W. & Co., Holyoke, Mass. Salem Wire Nail Co., Salem, O. Stewart Wire Co., Easton, Pa. Trenton Iron Co., Trenton, N. J. Washburn & Moen Mfg. Co., Worcester. Wetherell Bros., 93 Liberty St., N. Y. Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y. Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.** E. T., Detroit, Mich. Clinton Wire Cloth Co., Clinton, Mass. Darby, Edward & Sons, Philadelphia. Estey, W. S., 65 Fulton, N. Y. Gilbert & Bennett Mfg. Co., 42 Cliff. Howard & Morse, 16 Fulton, N. Y. Ludlow-Saylor Wire Co., St. Louis, Mo. N. J. Wire Cloth Co., Trenton, N. J. New York Wire Cloth Co., 102 Chambers St., N. Y. Scheeler & Sons, Buffalo, N. Y. Wickwire Bros., Cortland, N. Y. Wright & Colton Wire Cloth Co., Worcester, Mass. W. S. Tyler Wire Works Co., Cleveland.
- Wire Cutters.** King, J. M. & Co., Watertown, N. Y.
- Wire Dies.** McFarland, Wm., Trenton, N. J. Newton & Shipman, 83 John St., N. Y.
- Wire Dowels.** Bond Nail Co., Raynham, Mass.
- Wire Fences, See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.** Am. Wire Goods Co., Lowell, Mass. Darby, Edward & Sons, Phila. Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y. Ludlow-Saylor Wire Co., St. Louis. Myers, Fred J. Mfg. Co., Hamilton, O. New York Wire Cloth Co., 102 Chambers St., N. Y. Scheeler & Sons, Buffalo, N. Y. Wickwire Bros., Cortland, N. Y. Williamson, C. T., Wire Novelty Co., Newark, N. J. Wire Goods Co., Worcester, Mass.
- Wire Hangers.** Barber-Koenig Mfg. Co., Hazleton, Pa.
- Wire Machinery.** Am. Tool Wks., Cleveland, O. Manville, E. J. Mch. Co., Waterbury, Ct. Morgan Construction Co., Worcester, Mass. Waterbury Mch. Co., Waterbury, Conn.
- Wire Nails.** Indiana Wire Fence Co., Crawfordsville, Ind. Kilmer Mfg. Co., Newburg, N. Y. New Castle Wire Nail Co., New Castle, Pa. Salem Wire Nail Co., Salem, O. Taunton Wire Nail Co., Taunton, Mass. Whitney, A. B. & Co., New York City.
- Wire Rops, Steel.** New Castle Wire Nail Co., New Castle, Pa. Washburn & Moen Mfg. Co., Worcester, Mass. Whitney, A. R. & Co., 17 B'way, N. Y. Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel, Makers.** Broderick & Bascom Rope Co., St. Louis, Mo. California Wire Works, San Francisco. Hazard Mfg. Co., Wilkesbarre, Pa. A. Leschen & Sons Rope Co., St. Louis. Trenton Iron Co., Trenton, N. J. Washburn & Moen Mfg. Co., Worcester, Mass.
- Wire Rope Machinery.** Kay, J. F., Passaic, N. J.
- Wire Straightening and Cutting Machinery.** Adt, John & Son, New Haven, Conn.
- Wood Turning.** Cleveland Wood Turning Co., Cleveland, O.
- Wood-Working Machinery.** Egan Co., Cincinnati, Ohio. Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Wrenches, Manufacturers of.** Bemis & Call Hardware & Tool Co., Springfield, Mass. Billings, Spencer & Co., Hartford, Conn. Coes Wrench Co., Worcester, Mass. Tower & Lyon, 95 Chambers St., N. Y. Trimont Mfg. Co., Roxbury, Pa. Walworth Mfg. Co., Boston, Mass.
- Wringers.** Colby Wringer Co., Montpelier. Peerless Mfg. Co., Cleveland, Ohio.
- Yacht Hardware.** Ferdinand, L. W., & Co., Boston, Mass.

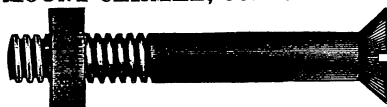
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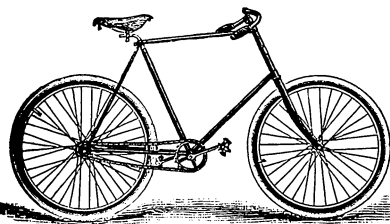
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Leochen, A. & Sons Rope Co.....	6	Norwalk Iron Works Co.....	38	Scott, Geo. M.....	37	Tucker & Dorsey Mfg. Co.....	87
Lewis, Henry & Co.....	20	Obermayer, S. Co.....	20	Scranton & Co.....	37	Tudor Iron Works.....	1
Lewis Tool Co.....	63	Ogden & Wallace.....	19	Scranton Forging Co.....	91	Tyler Wire Works Co. W. S.....	58
Lidgerwood Mfg. Co.....	108	Old Dominion Iron & Nail Works Co.	91	Scranton Supply & Machine Co.....	52	Union Hardware Co.....	73
Lincoln Iron Works.....	44	Olds Wagon Works.....	82	Seaman, Sleeth & Black.....	21	Union Lock & Hdw. Co.....	87
Lindsay, Jas. G. & Co.....	15	Oster Mfg. Co.....	44	Sebastian Lathe Co.....	46	Union Mfg. Co.....	14
Link-Belt Engineering Co.....	37	Ostrander Fire Brick Co.....	26	Sellers, Wm. & Co.....	47	Union Metallic Cartridge Co.....	1
Lockhart Iron & Steel Co.....	37	Ostrander, W. R. & Co.....	93	Seneca Falls Mfg. Co.....	46 & 64	Union Show Case Co.....	68
Logan & Stowbridge Iron Co.....	84	Otto Gas Engine Works.....	30	Sessions Foundry Co.....	22	U. S. Projectile Co.....	41 & 64
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Lovell, Jno. P. Arms Co.....	108	Palmer Hardware Mfg. Co.....	60	Shelby Steel Tube Co.....	24	Valley Pump Co.....	33
Lucas, C. O. & Co.....	27	Pancoast, Henry B. & Co.....	42	Shelton Co.....	11	Van Dorn Iron Works Co.....	7
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Lukens Iron & Steel Co.....	24	Passaic Rolling Mill Co.....	18	Shickle, Harrison & Howard Iron Co.	22	Wads & Roos Punch & Shear Co.	38
Lundberg, Gustaf.....	17	Peck, A. G. & Co.....	108	Shoenberger & Co.....	90	Walker Mfg. Co.....	23
Lunkenheimer Co.....	29	Peerless Mfg. Co.....	82	Shultz Belting Co.....	1	Wallace Wm. H. & Co.....	14
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McCaffrey File Co.....	67	Penn Elevator Engineering Co.....	47	Sidney Steel Scraper Co.....	97	Wardlow, S. & C.....	16
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Mahoning Valley Iron Co.....	17	Pierson & Co.....	17	Smythe, S. R. Co., Inc.....	24	Westwick, J. & Son.....	29
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National Horse Nail Co.....	93	Rhodes, L. E. Co.....	51	Swedish Razor Co.....	71	Worthington, Henry R.....	33
National Pipe Bending Co.....	30	Rice Mfg. Co.....	25	Sweetser, W. A.....	10	Wright & Colton Wire Cloth Co.....	8
National Saw Co.....	64	Richardson, C. F. & Son.....	61	Swindell, W. & Bros.....	24	Wrightsville Hardware Co.....	59
National Structural Tubing Co.....	13	Richards, I. F.....	107	Syracuse Smelting Works.....	4	Wurster, F. W. & Co.....	108
Newark Machine Tool Works.....	58	Richmond Cedar Works.....	85	Tablet & Ticket Co.....	61	Wyman & Gordon.....	94
New Britain Hardware Mfg. Co.....	90	Ridgway, Craig & Son.....	40	Talbot Mfg. Co.....	63	Yale & Towne Mfg. Co.....	48 & 61
New Castle Wire Nail Co.....	10	Riehle Bros. Testing Machine Co.....	34	Talcott, W. O.....	34	Zucker & Levett & Loeb Co.....	27
New Haven Copper Co.....	2			Tanite Co.....	108		

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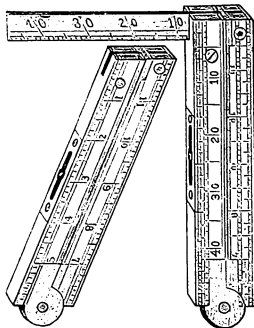
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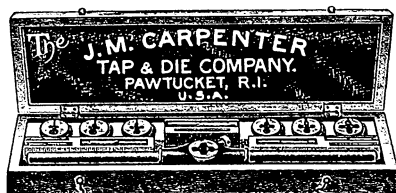
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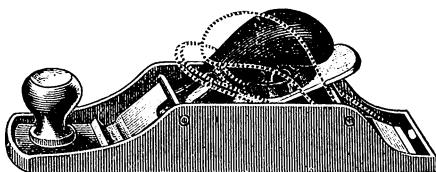
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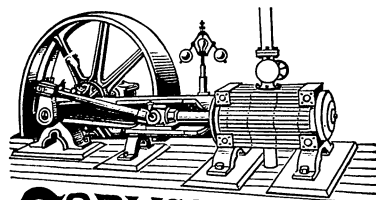
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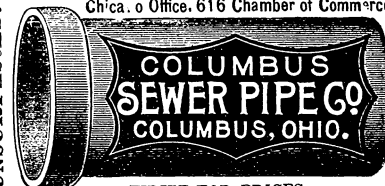
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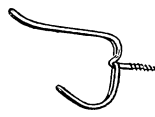
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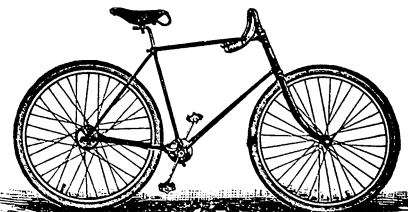
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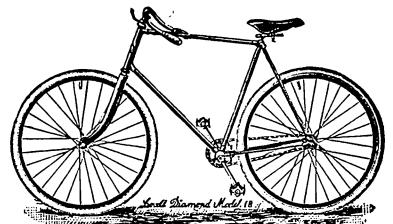
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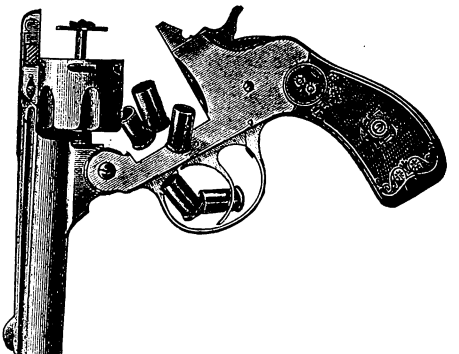
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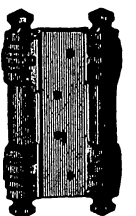
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THE IRON AGE

THURSDAY, NOVEMBER 15, 1894.

The Proposed U. S. Torpedo Boats.

Plans and specifications have been prepared by the Bureau of Steam Engineering of the United States Navy Department for torpedo boats Nos. 3, 4 and 5, which are designed to make a speed of 24½ knots per hour at a displacement of 135 tons. These boats differ very materially from the "Eric-

	Dimensions.	
	"Ericsson."	New design.
Length on load water line.....	150 feet.	180 feet.
Beam on load line.....	15.5 feet.	16 feet.
Mean draft.....	4.75 feet.	5 feet.
Displacement.....	120 tons.	135 tons, about.
Indicated horse-power (est.).....	1,800.	2,000.
Speed per hour (est.).....	24.	24½.
Coal capacity.....	40 tons.	50 tons.
Armament.....	One bow tube.	Three deck tubes.
	One twin deck tube.	Three 1-pdr. R. F. guns.
	Four 1-pdr. R. F. guns.	

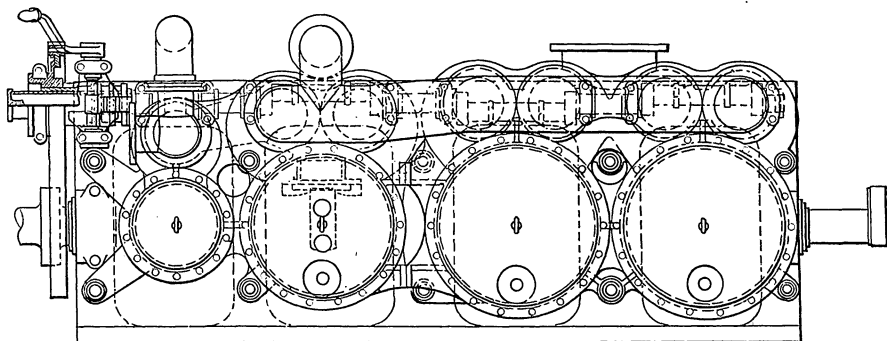


Fig. 1.—Plan View of Engines.

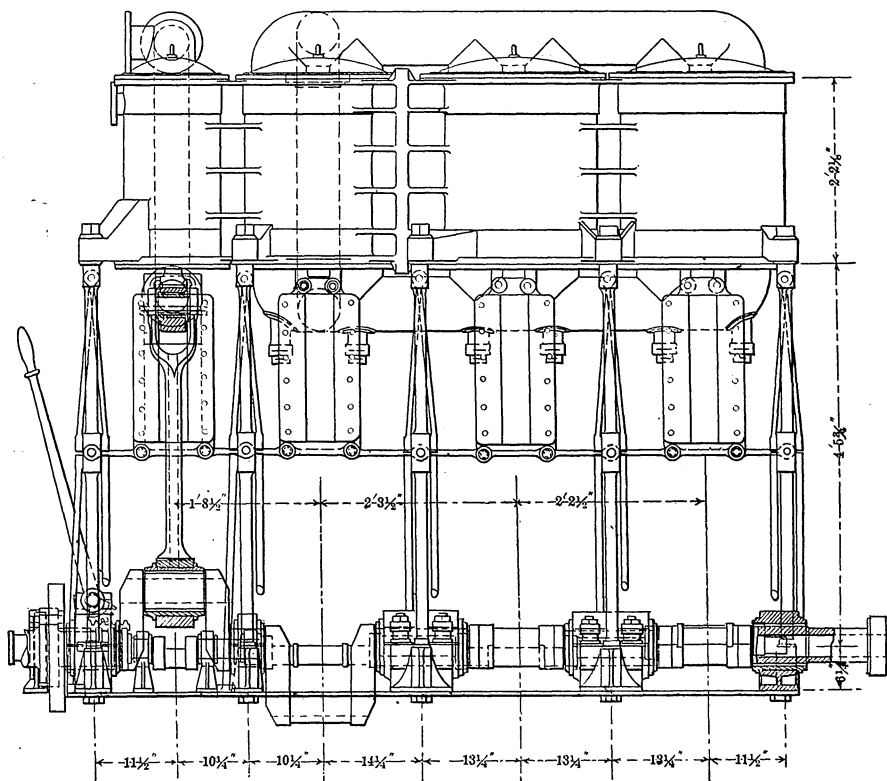


Fig. 2.—Side Elevation of Engines.

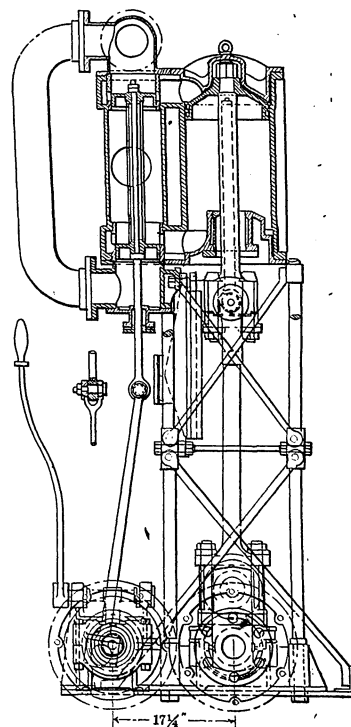


Fig. 3.—Sectional End Elevation through H. P. Cylinder.

THE PROPOSED U. S. TORPEDO BOATS.

son," which was described and illustrated very fully in *The Iron Age* of January 21, 1892. The principal differences are found in the arrangement of the machinery and in the changes it has been thought desirable to make in the engines. The main changes made in the newer boats are presented in the accompanying table:

The allotment of weights in tons is as follows:

	"Ericsson."	New design.
Hull and fittings.....	48.54	54
Engineers' weights.....	51.76	60
Ordnance weights.....	5	5.5
Coal.....	9	9
Boats, electric plant and miscellaneous.....	5.70	7
Totals.....	120.00	135.5

From the specifications we take the following description of the engines, boilers and auxiliary machinery.

General Description.

The propelling engines will be alike and each will be placed in a separate water tight compartment. These engines will be of the vertical inverted cylinder,

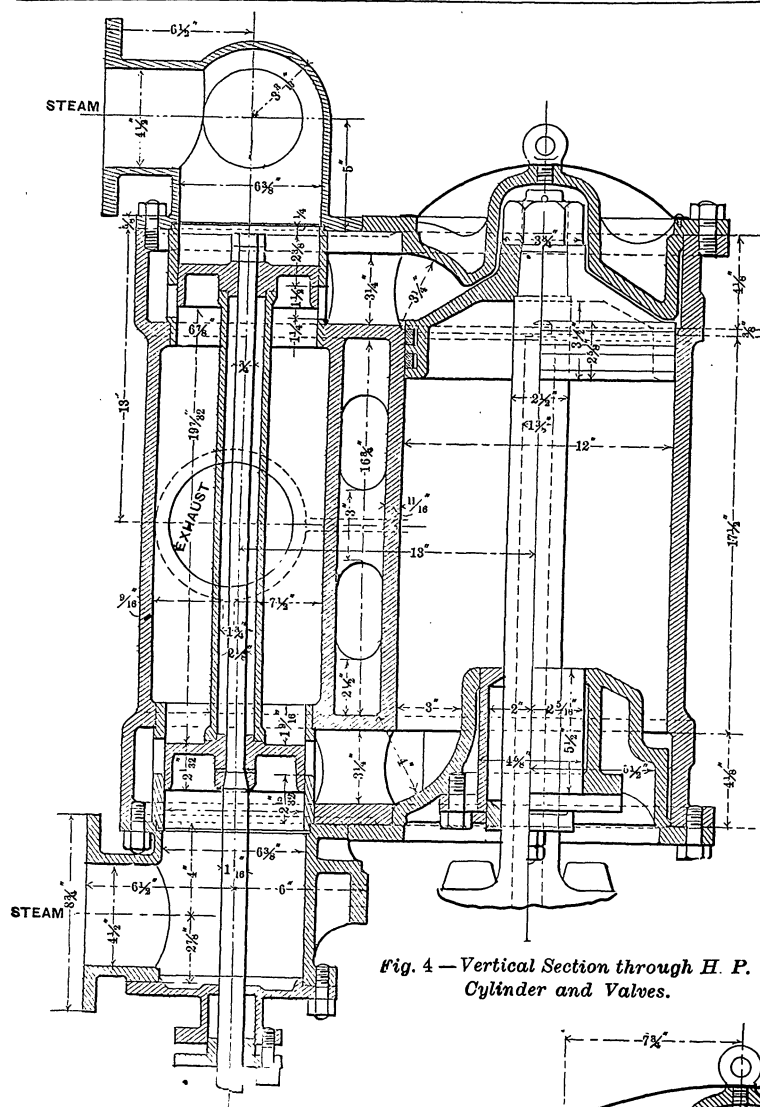


Fig. 4.—Vertical Section through H. P. Cylinder and Valves.

direct, acting, triple expansion type, each with a high pressure cylinder 12 inches in diameter, an intermediate pressure cylinder 19½ inches in diameter, and two low pressure cylinders each 22 inches in diameter, the stroke of all pistons being 16 inches. The indicated horse-power of propelling engines will be about 2000, when the engines are making about 412 revolutions per minute. The high pressure cylinder will be aft in the starboard engine and forward in the port engine, and the low pressure cylinder will be forward in the starboard engine and aft in the port engine, as shown in the plan, Fig. 9.

The main valves will be worked by means of cranks on a shaft parallel to the main engine shaft and geared to that shaft. All the main valves will be piston valves, there being one for each high pressure, two for each intermediate pressure and two for each low pressure cylinder.

Each main piston will have one piston rod, with a cross head working in a slipper guide. The framing of the engines will consist of vertical forged steel columns well stayed by diagonal braces. The engine bed plates will be of plate steel, supported on wrought steel keelson plates built in the vessel. The crank shafts will be made in one section and will be hollow.

There will be two condensers made entirely of composition and sheet brass. Each will have a cooling surface of about 800 square feet, measured on the outside of the tubes, the water passing through the tubes. For each propel-

ling engine there will be a single acting air pump driven from the main engine shaft. The circulating pumps will be of the centrifugal type, one for each condenser. The propellers will be right and left, of manganese bronze or approved equivalent metal.

There will be two water tube boilers constructed for a working pressure of 250 pounds per square inch. Each boiler will be placed in a water tight compartment, one being forward of the engines and the other aft. The total grate surface will be at least 95 square feet, and the total heating surface at least 5120 square feet. There will be two smoke pipes, one for the forward and one for the after boiler.

The Cylinders.

The four cylinder casings of each engine will be made in two castings, the high and intermediate pressure forming one and the two low pressure cylinders the other. These castings will be so bored, and flanges for securing them to each other so faced, that when bolted together the distances between centers of cylinders beginning with the high pressure will be 20½, 27½ and 26½ inches.

The high and intermediate pressure cylinder casings, Figs. 4 and 5, will be of close grained cast iron as hard as can be properly worked, and each will contain the high and intermediate pressure cylinders of its engine. The barrels will be 1½ inch and the valve chests 1½

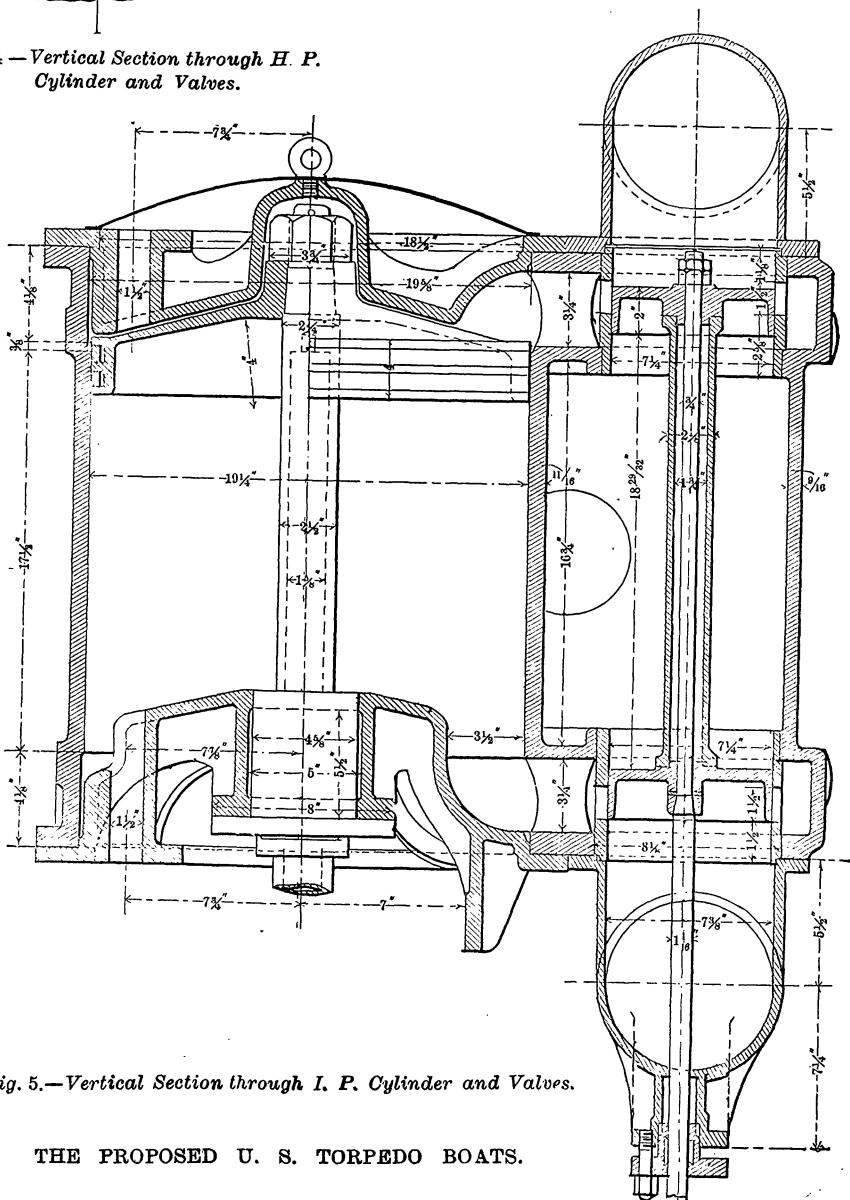


Fig. 5.—Vertical Section through I. P. Cylinder and Valves.

THE PROPOSED U. S. TORPEDO BOATS.

inch thick. Each will have one piston valve for the high pressure cylinder and two piston valves for the intermediate pressure cylinder. They will be faced and bored to the sizes of the cylinders and for the valve chest linings. The brackets at the bottom for attachment of the supporting columns will be well

flanges being $\frac{1}{16}$ inch thick. They will be so formed as to leave as little clearance as practicable.

The Valve Chests.

The valve chest of each high pressure cylinder will be fitted for one, each intermediate pressure for two, and each low

pressure, leaving the body of the liners $\frac{7}{16}$ inch thick. They will be forced into place, making all joints perfectly tight. The steam ports will have alternating right and left diagonal bridges of such a section as to permit of the easy passage of steam, taking up not more than two-tenths of the port area.

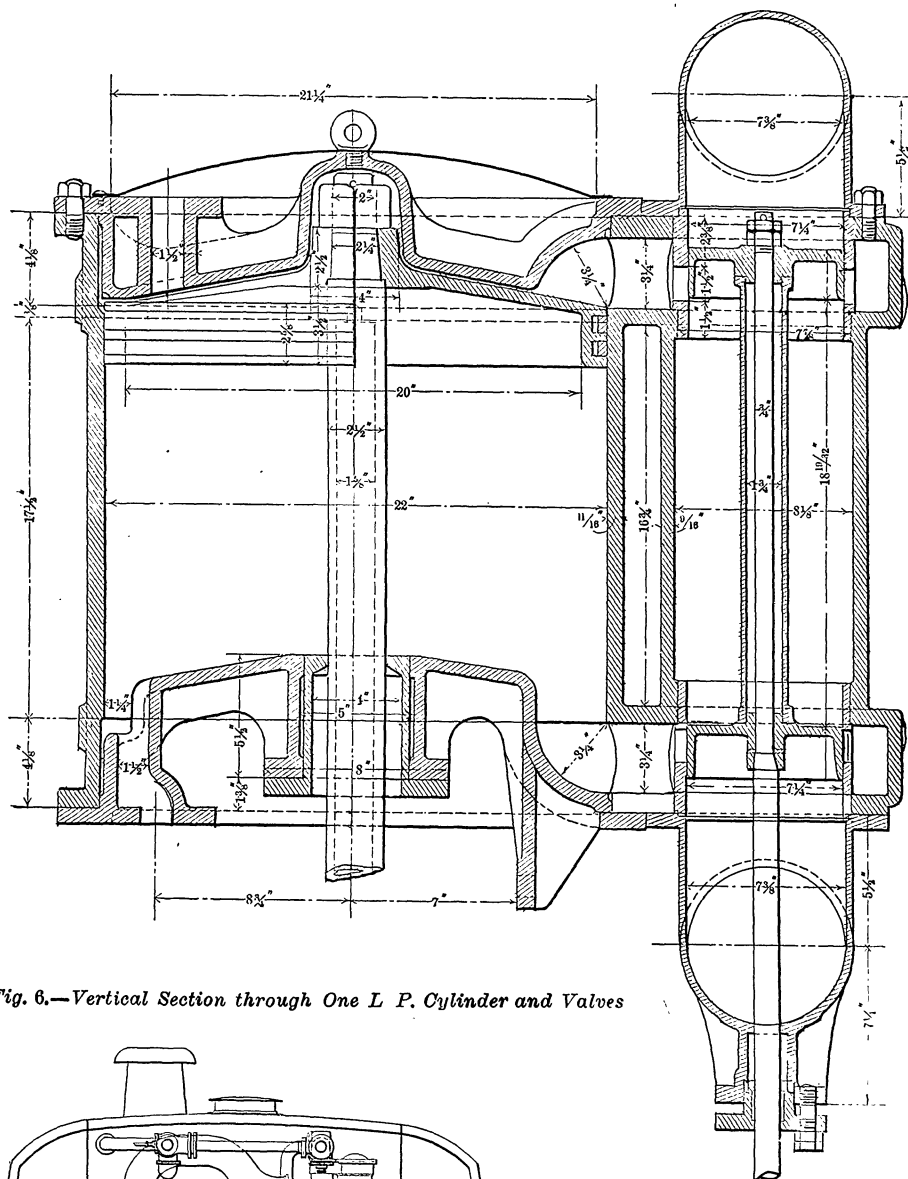


Fig. 6.—Vertical Section through One L. P. Cylinder and Valves

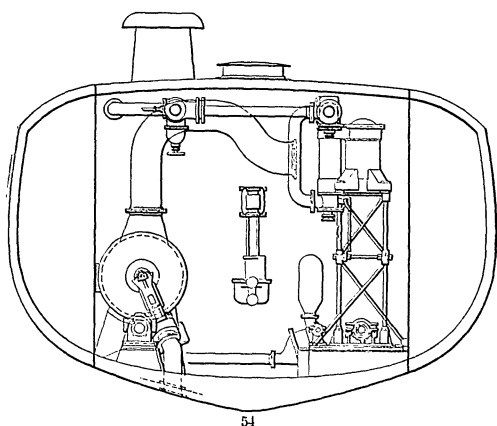


Fig. 7.—Transverse Section at Frame 54.

THE PROPOSED U. S. TORPEDO BOATS.

ribbed and faced. The lower heads
will be removable.

The barrels and valve chests of the low pressure cylinder casings will be the same thickness as the others. Each casing will have four piston valves, two for each low pressure cylinder. The cylinder covers will be made of cast steel, $\frac{1}{2}$ -inch finished thickness, and well stiffened by $\frac{1}{8}$ -inch ribs, the

pressure for two piston valves. There will be a working lining at each end of each valve chest for each piston valve. They will be of close grained cast iron, as hard as can be properly worked, accurately turned to fit the casings, and accurately bored and polished with emery to an internal diameter of $6\frac{1}{4}$ inches in the high pressure and $7\frac{1}{4}$ for each of the valves of the intermediate and low

The valves will not have any packing rings, but all will be turned and polished with emery to fit their cylinder liners accurately.

Pistons.

They will be of cast or forged steel, finished all over, and will be dished. Each piston will have two packing rings, each $\frac{3}{4}$ inch wide, and $\frac{3}{4}$ inch thick, of hard cast iron, cut obliquely and tongued. The packing rings will be sprung in without followers. There will be sufficient clearance between the piston and cylinder to allow for difference of expansion. Each piston must be carefully gauged, and care taken that the clearance between the piston and cylinder head and cover is as called for on the drawings. When completed the pistons must be carefully weighed, and no excess of weight will be allowed over that due to the dimensions shown on the drawings.

The piston rods will be hollow and made of forged steel, oil tempered, $2\frac{1}{8}$ inches outside diameter, and $1\frac{1}{8}$ inches inside

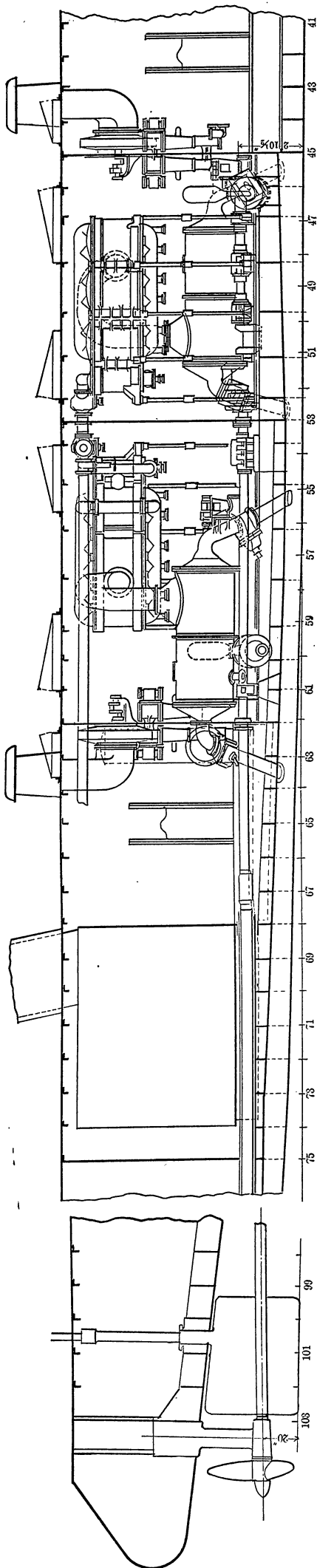


Fig. 8.—Longitudinal Sectional Elevation of Hull.

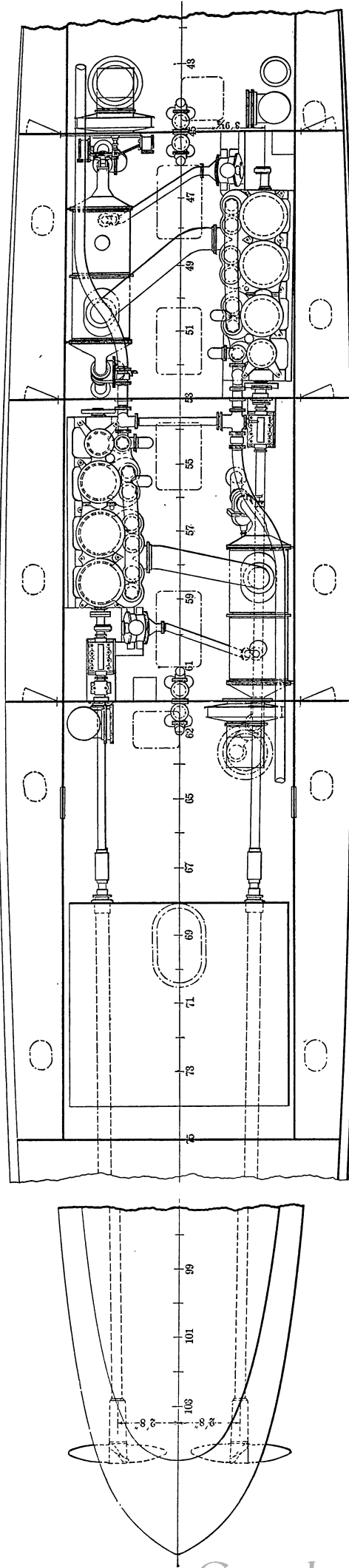


Fig. 9.—Sectional Plan, Showing Arrangement of Engines.

THE PROPOSED U. S. TORPEDO BOATS.

diameter for the high and intermediate pressure cylinders, and $1\frac{1}{4}$ inches inside diameter for the low pressure cylinders. They will be turned to fit the pistons, with shoulders as shown, and fitted each with a composition nut at piston end secured by a screw stop pin. The parallel parts will be smoothly and accurately ground.

The Connecting Rods

with their bolts and caps will be of forged steel, finished all over, and oil tempered. They will be 40 inches long between centers, turned $2\frac{1}{2}$ inches in diameter at small end and $2\frac{3}{4}$ inches at large end, with a hole bored through the entire length of each, $1\frac{1}{4}$ inches for the high and intermediate pressure and $1\frac{1}{2}$ inches for the low pressure rods. The cross head end of each rod will be forked to span the cross head, and will have the cross head pin shrunk into it.

The cylinders will be supported by ten wrought steel columns, as shown in the drawings, Figs. 2 and 3. The columns will be stiffened by wrought steel tie rods, as shown.

The bed plates will consist each of a single $\frac{1}{2}$ -inch steel plate, secured to the coal bunker bulkhead by angle iron and distance pieces and stiffened on the top by a longitudinal angle iron on the inner edge. The main pillow block steel castings will be secured by bolts which will pass through the bed plate and also the engine keelsons, and the engine columns will be bolted to facings cast on the pillow blocks. The bed plate will be cut out for the swing of the cranks, and will rest on a yellow pine base 1 inch thick, which will rest on longitudinal and transverse keelsons built in the ship.

Crank Shaft Bearings.

The pillow blocks will be made of cast steel. There will be bottom brasses only, the caps taking the place of top brasses. The caps, made of cast steel, will have white metal fitted in dovetailed recesses, and the white metal will then be hammered in place; the bottom brass, which will be turned cylindrical, is fitted with white metal similarly to the cap. The bottom brasses and the caps will be fitted with ample oil channels and faced on ends, and will be fitted to pillow blocks.

After the engines are secured in the vessel the brasses and caps will be bored out in place to perfect alignment, if required. They will also be tried on their shafts and any defects made good by scraping to a proper bearing. The cross head guides will be of the slipper type, made of composition and cast hollow for circulation of water to keep them cool.

Valve Gear.

The valve gear, Figs. 2 and 3, will consist of a valve motion shaft, placed on the inboard side of each engine parallel to and making the same number of revolutions as the crank shaft. The motion will be given to the valves from cranks on the valve motion shafts, through valve connecting rods. These shafts will be enlarged at the forward end of the port engine and after end of the starboard engine. The motion will be transmitted from, and the reversing gears placed at, the enlarged ends. On the enlarged end of each shaft will be shrunk and pinned a composition sleeve with four spiral feathers on its surface, forming part of the sleeve, and spaced at distances of 90° . At the forward end of the fixed sleeve will be a flange, and at the after end a cap of larger diameter will be bolted to the end of the

shaft, so as to limit the movement of the loose sleeve forward and aft. This loose sleeve, which will be made of steel, will have on the inside four spiral grooves equally spaced and of not less than 15 inches pitch. The grooves and the feathers on the fixed sleeve provided for them must be a good working fit throughout their entire length, and must have no backlash. The loose sleeve will have on it a gear wheel, which will have a feather in the boss, so that its rotary motion will be transmitted to the loose sleeve, while the sleeve can be moved fore and aft, though the gear wheel will be firmly held by a bracket bearing. The gear must be so constructed that when the engine is going ahead or back the loose sleeve will have a tendency to remain in position fore and aft. There will be several collars on this sleeve for receiving this fore and aft motion. These collars will fit into the bottom of a composition rack, which will have guides to insure its having only a fore and aft motion. Into this composition rack will mesh a quadrant gear on a horizontal shaft deriving its motion from a reversing lever in a vertical plane. The gears transmitting the motion from the crank shaft to the valve motion shaft will have "herring bone" machine cut teeth, and will be of cast steel.

The exhaust passage from the high pressure to the intermediate pressure steam chest will be cast in the casing of these two cylinders; it is of circular form and will have an internal diameter of $6\frac{1}{2}$ inches. The exhaust passages from the intermediate pressure to the two low pressure cylinders will consist of cast brass pipes at the top and bottom, bolted on the flanges of the valve chests and taking the place of valve chest bonnets; they will be $7\frac{1}{2}$ inches internal diameter and will be finished all over on the outside. There will be a 12-inch nozzle cast on the common exhaust chamber of the two low pressure cylinders, which will be connected with the condenser by a copper pipe.

Shafts.

All the crank, line, thrust and propeller shafts will be of forged steel. Each length will be forged solid in one piece.

The crank shaft for each propelling engine will be in one section. Each crank will have a throw of 8 inches. Each crank shaft will have a coupling disk $1\frac{1}{2}$ inches thick and 11 inches diameter forged on the after end. The crank pins will be $5\frac{1}{2}$ inches diameter and $8\frac{1}{2}$ inches long for the high and intermediate pressure, and $6\frac{1}{2}$ inches long for the two low pressure cylinders. The length of the starboard shaft will be 9 feet $10\frac{1}{2}$ inches, and the length of the port shaft will be 9 feet $2\frac{1}{2}$ inches. There will be holes $3\frac{1}{2}$ inches in diameter bored axially through each crank shaft and crank pins. The cranks of the high and intermediate pressure cylinders will be opposite each other, and the two low pressure cranks will be similarly placed with regard to each other. The high and intermediate pressure cranks will make an angle of 90° with the first and second low pressure cranks. The sequence will then be high pressure, second low pressure, intermediate pressure, and first low pressure.

The thrust shafts will be $4\frac{1}{2}$ inches in diameter increased to $4\frac{3}{4}$ inches at the thrust collars, about 21 feet 4 inches long on the starboard side and about 11 feet 2 inches long on the port side. The

shafts will be solid. Each shaft will have eight thrust collars $\frac{1}{2}$ inch wide, with spaces of $1\frac{1}{2}$ inches, the collars to be $7\frac{1}{2}$ inches outside diameter.

The propeller shafts will each be in one section. Each will be 5 inches in diameter and will be solid. The shafts will be about 33 feet 6 inches long, cased with composition $\frac{3}{8}$ inch thick at the bearings and elsewhere with a solid drawn brass pipe $\frac{1}{4}$ inch thick. The casing will be shrunk and pinned on and must be water tight.

The screw propellers will be of manganese bronze or approved equivalent metal. The starboard propeller will be right and the port one left handed.

Condensers.

There will be two cylindrical condensers, each 2 feet $7\frac{1}{2}$ inches outside diameter, made of sheet brass No. 11 B. W. G. The shell will be in one part, and will be stiffened at center by a brass ring of T section. There will be the following openings in each condenser, each with properly faced flanges—viz.: One for main exhaust pipe, 12 inches diameter; one for air pump suction pipe, $3\frac{1}{2}$ inches diameter; one 7-inch hand hole on top. Each condenser will contain 820 seamless drawn brass tubes, $\frac{1}{2}$ inch outside diameter, No. 20 B. W. G. in thickness; they will be 6 feet long between tube sheets, and will be spaced $\frac{1}{16}$ inch between centers. The cooling surface of each condenser will be about 800 square feet, measured on the outside of the tubes.

There will be one single acting inclined trunk air pump for each engine, worked by an eccentric on the main shaft, as shown.

Boilers.

There will be two boilers of the sectional, coil or tubulous type. The design must be approved by the Bureau of Steam Engineering. The total grate surface will be at least 95 square feet, and the total heating surface at least 5120 square feet. The boilers must supply sufficient steam to run all the steam machinery on board at full power. Efficient means must be provided for getting at the interior of such parts of the boiler as require attention for examination, cleaning or repair. They will be built for a working pressure of at least 250 pounds per square inch. The boilers will be tested under a pressure of 360 pounds.

The Ottoman Minister of War has decided that in future Mauser and Martini-Henry rifles will be manufactured in the workshops of the Government arsenal at Constantinople, instead of being obtained from abroad. To this end the workshops are being fitted with the necessary plant. Special laboratories are also being constructed for the manufacture of a smokeless powder invented by a Turkish officer.

Recent reports from the British Consul at Chefoo, China, to his Government, intimate that there is as yet little or no opening for the importation of machinery into China. The Chinese have not yet been convinced of the utility of adopting any modern labor saving machinery. Perhaps one of the effects of the present war may be the enlightening of the celestial mind and the opening up of China in this respect.

The Scotch coal miners' strike is at an end, and the collieries are again in full operation.

The Foundrymen's Association.

The third annual meeting of the Foundrymen's Association was held at the Manufacturers' Club, in Philadelphia, on Wednesday, November 7. The chair was occupied by the president, Francis Schumann of the Tacony Iron & Metal Company, Tacony, Pa.

The reading of the minutes of the last meeting was dispensed with, the same having appeared in *The Iron Age* of October 11. The Executive Committee reported that at their last meeting the impression was formed that while there might be some improvement in business in different parts of the country it was not general. Prices, while low in the extreme, did not seem to have reached bottom. Discussion had evolved the fact that immigration had decreased very materially in recent months and wages had been lowered in a number of shops. This association as an organization had deemed it advisable not to interfere with wages or prices of castings. In regard to association affairs the committee wished to improve the social element of the association and have the foundrymen meet and talk over the situation of business so that a comparison of wages and prices of castings might be made to the interest of all concerned. The committee had heard members of the association as well as non-members complain that certain members had cut prices on castings. The association had done nothing to prevent it, hence there was more reason that interest in the association should be kept up and a good feeling brought about which would surely bring confidence and in time would tend to advance prices. The committee had been advised that another association had met monthly for over 12 years before an arrangement was made in the direction of a uniform price on stove castings, and during all those 12 years the association was a social organization, members becoming acquainted and a confidence developing, resulting ultimately in success instead of failure. The committee therefore pointed out the fact that members could not expect too much from this association in a short time, but in the end they would find their memberships good investments. Reports were next called for from the different sections of the Price Committee.

Malleable and Gray Iron Castings.—Stanley G. Flagg, Jr., for this section reported progress.

Cast Iron Soil Pipe.—For this section R. A. Regester reported that prices had in his opinion reached bottom.

Sash Weights.—E. E. Brown stated that there had been little change in this section. He would be glad to report that prices had reached bottom, but it would seem that there was no bottom, as lower prices were heard of every few days.

Cast Iron Gas and Water Pipe.—P. D. Wanner in reporting for this section said that prices did not seem to have a bottom. Pipe founders had been very busy during the year, and yet pipe had been sold at prices below cost, and foundries were still pursuing that course. They seemed neither to break up nor shut up. He thought, however, that at the end of the season they would manage to pick themselves up and ascertain their losses and come to a determination to ask better prices for next year. He hoped all would

start in on that basis, as there was every reason for it.

The treasurer, Josiah Thompson, submitted his report of the finances of the association for the year just closed, showing that \$1180.91 had come into his hands and \$810.48 had been paid out for expenses, leaving a balance in the treasury of \$370.43. Election of officers being next in order the gentlemen nominated at the last meeting were, upon motion directing the casting of one ballot by the secretary, declared elected. The officers for the ensuing year, therefore, are as follows:

President, Francis Schumann.
Vice-president, P. D. Wanner.
Treasurer, Josiah Thompson.
Secretary, Howard Evans.
Executive Committee, Walter Wood, chairman; Thos. Glover, Stanley G. Flagg, Jr., E. E. Brown and Wm. Sauter.

President Schumann then addressed the meeting as follows:

The President's Address.

The celebration of our third anniversary is an occasion to review the events of the past year in connection with our industry—the causes of the prevailing business depression and their effect upon our calling, and finally the utility of our association in meeting and correcting the tendency to a greater disarrangement between the two factors, supply and demand, or production and consumption.

The development of our country during the last four decades was enormous, beyond all preconceived ideas; nothing similar had ever occurred before in the history of the world from which anything like it could be deduced. The flow of emigration continued steadily, filling both our Western territories and cities in the older States. Large sections were changed from a wilderness to populated States in a few short years. The growth was so rapid and the demands upon our industrial resources so great that from necessity we were obliged to expand accordingly. Roads, bridges, railroads, buildings, machinery—in fact all productions of civilization, which, under ordinary conditions required years to supply, were demanded and furnished in incredibly short periods. So called "booms," or periods of exceptional business prosperity, were the order of the day. While financial disturbances occurred from time to time, they were the result of speculation rather than legitimate projects or exploits, induced by the rush and whirl prevailing and the overconfidence of capital in any enterprise whatever.

It is evident that the pace of our growth is lessening to a more steady and enduring one, and it behooves us to carefully watch the passing events so that we may be prepared to check the momentum of the machinery which was set in motion, in time to avert disastrous results. The machinery I refer to are the various industries of our country, creating products of civilization other than that of agriculture, which produces the essentials. The capacity for the first has been expanded far beyond the needs of the country for years to come. Shrinkage in the volume of business, diminished profits and wage rate must result until the growth of the country and its industries will again be in equilibrium and the much desired stability in commerce be finally attained. The following data, obtained from the Bureau of Statistics, within a few weeks, show the conditions most graphically. We find:

Year.	Population of the United States.	Increase. Per cent.
1850.....	23,191,876	About 38
1860.....	31,443,321	About 28
1870.....	38,558,371	About 30
1880.....	50,155,783	About 25
1890.....	62,622,250	Average 29

Wheat and corn produced.		
Bushels.		
1880.....	1,998,657,420	
1890.....	2,603,452,000	80
Railroads.		
Miles operated.		
1880.....	93,293	
1890.....	166,708	80
Coal produced.		
Long tons.		
1880.....	70,478,426	
1890.....	150,505,745	113
Pig iron produced.		
Long tons.		
1880.....	4,144,254	
1890.....	8,279,370	100

It appears that, while the population and production of wheat and corn have nearly kept pace, increasing at the rate of about 30 per cent., the increase in the production of coal and iron has been over three times as great, and railroads nearly so. We know that the uses for iron have been greatly enlarged in recent times; but not enough to account for the above excessive increase. Hence we are compelled to look forward to a decrease in the output to such a point that the increase will be more nearly equal to that of the population, because it is reasonable to assume that we will soon reach a point when the use for iron will be at its maximum; after which the increase in its production must equal that of the population, unless we can create a foreign market, which at present seems far removed. We must prepare ourselves for a continued diminished volume of business. Although moderate revivals may be expected in the near future, they should not mislead us to believe that the old order of things had again come. The shrinkage in business coming upon many of us comparatively suddenly—although not unexpected—signs having been manifest during the last seven or eight years—tends to, and has already caused, serious and ruinous competition. Our profits, gauged by the capital invested and close application to business, are practically nothing. Each one is striving to obtain more than his proper allotment of work, under existing conditions, cutting prices continually, vainly waiting for a time of revival when he hopes to make good his losses, or consoling himself that he will be one of the survivors—considering himself one of the fittest—to tide over these trying times.

I maintain that our association, when fully established, can be utilized to remedy the evil and aid us in at least obtaining a profit, however small, on the diminished amount of business remaining. Let us impress upon all foundrymen the importance of united action. Let us meet and counsel together, and let us solemnly agree to keep faith and abide by our joint action. Let us endeavor to include all foundrymen in the organization. Let us make it national, and then meet in convention to devise ways and means for our welfare. All we strive for is but a fair compensation, which seems possible only through united effort.

Let those of us who feel aggrieved, because the mere organization of our association did not at once bring about the hoped for improvement, but consider the difficulties. We must first bring into the association the great majority of foundrymen throughout the country before any results can be expected, and if fair men, they will do all in their power to increase our prestige rather than find fault. We have all reason to be gratified with the present condition of our association. While

our numbers are not yet great the morale is exceptional. Our meetings have proved of interest. We enjoy our social reunions after the transaction of business, and we have learned to appreciate and respect each other.

A more universal participation in the discussions at our meetings is desirable, and I would suggest that to dispel the diffidence on the part of many of our members who deem themselves lacking in ability to debate, we give more attention to the social side of our meetings, so that a closer and more intimate acquaintance may result. We have steadily gained ground and are, financially, in excellent condition. What we need is an extended field over the whole country. Let associations be formed in all sections that can eventually be merged into a national organization. When this is once attained the desired results will come of themselves.

Finally, I would suggest the creation of a committee on organization, whose duties would be the formation of fraternal associations far and wide. With perseverance and patience we cannot fail of success.

Letters From Founders.

Under the head of "New Business," Secretary Evans then announced that he had written to a number of foundrymen and others, asking them to state the condition of affairs in their districts as regarded the foundry business, what they had been doing, what they were now doing, and what they expected to do in the future. A good many replies had been received. The Wilmington Pipe & Foundry Company, Wilmington, Del., stated that business was still very dull, with little prospect of improvement. Such little work as was being done was accepted at prices leaving no profit. Rogers, Brown & Warner, Philadelphia, dealers in pig iron, steel and coke, reported a much more satisfactory condition of business than had existed at any time during the last 18 months. Their business in October was largely scattered and was greater in magnitude than in any month for over a year past, orders coming mostly from the foundry trade. Business was retarded so far in November, owing to the elections. Indications, however, pointed toward considerable activity in the iron trade in the event of the elections turning out favorable to the views of the majority of iron men.

W. S. Withers, Atlanta, Ga., iron and brass founder, intimated that the foundry business in his section had undergone no material change for the better. There appeared to be a temporary revival about two or three months ago based upon the expectancy of good prices for cotton, but the recent fearful decline in prices on this staple had seriously interfered with advancement. The unsettled condition of politics also warranted no settled policy in national finance for the near future. Atlanta, upon the whole, was in a much better condition than the average of other cities of the Union. Trade was reasonably good, but castings were furnished at reduced prices.

The A. L. Swett Iron Works, Medina, N. Y., hardware specialties, soil pipe and fittings, reported that the future was none too bright. They had managed to sell more goods during the past year than the year previous, but it had cost them much greater effort and expense. Profits had been small and the total amount in dollars and cents less than in 1893. Their factory was running on full time and they were paying as high wages as ever; although of late

they had thought it policy to reduce their force somewhat, and expected to reduce it still more, and possibly wages, during the fall. Other manufacturers in their district had been running quite steady. They thought it very important that manufacturers consider matters and look well to their own protection. While they believed the day for high prices was past, they also believed that prices had gone as low as they could on either raw material or manufactured goods. The question now was simply how cheap Yankee ingenuity could manufacture wares and place them on the market at a margin.

The Russell & Erwin Mfg. Company, New Britain, Conn., hardware, stated they were fairly busy in their foundry department, but could make no predictions for the future. They believed the same conditions prevailed generally with other foundries in their neighborhood with possibly one or two exceptions.

I. S. Spencer's Sons, Guilford, Conn., founders and manufacturers, could see no very great improvement in their vicinity. They were running their factory four and five days a week, instead of three and four, which was about all the improvement they could report.

The Lexington Foundry Company, Lexington, Ky., stove founders, said that the future outlook for business in their section was all they could expect. They were running on full time, and the bulk of their output was readily consumed. Buying, however, was in small quantities, and they anticipated no heavy business for the remainder of the year.

The Ahrens & Ott Mfg. Company, Louisville, Ky., plumbers' iron and brass goods and steam fitters' supplies, reported that for the past two months they had been very busy, and that while prices were still very low and they saw no prospect of an improvement in prices for the next six months, they believed the demand was getting better.

The G. F. Warner Mfg. Company, New Haven, Conn., gray iron castings, stated that their business was quite brisk at present, but it was for the most part on holiday goods. They did not see firmness beyond December.

The Baltimore Bell & Brass Works, J. Regester & Sons, Baltimore, Md., reported that the iron pipe business was entirely out of condition and that anything in regard to the future was entirely beyond their vision.

The Penn Hardware Company, Reading, Pa., found trade with them much better than during the same period in 1893, but it was not so good as in 1892. They were running five days per week with almost their full force of hands.

The Chattanooga Foundry & Pipe Works, Chattanooga, Tenn., stated that affairs in their section were so badly mixed it would hardly be safe to predict anything; in fact, were they to do so their prediction would be one of gloom.

The A. A. Griffing Iron Company, Jersey City, N. J., reported that for the general run of foundry work business was dull and prices excessively low. There seemed to be no money in making foundry castings.

Robt. Allison & Sons, Port Carbon, Pa., machinery builders, reported that as far as their business was concerned they were doing more business than they had done for some time. Inquiries were better but prices so low as to make business really unprofitable. They were taking work more with the view of keeping their hands together than of making a profit, and by close buying of

material and economical practices they were able to make ends meet. The country was too large and possessed of too much material wealth to be kept down, and they looked forward to a revival of business in the near future.

The National Hardware & Malleable Iron Works, Thomas Devlin & Co., Philadelphia, stated they had been running full time during the past six weeks, and had made no reduction in wages in eight years. As they were not prophets they could not say what the future had in store for foundrymen.

The Pusey & Jones Company, Wilmington, Del., engines, boilers and machinery, sent the following record of the melts of their foundry from June, 1893, to October, 1894:

	Gross product Pounds.
1893.	
June.....	471,887
July.....	284,209
August.....	199,256
September.....	179,697
October.....	159,522
November.....	218,150
December.....	251,805
1894.	
January.....	144,089
February.....	216,438
March.....	188,850
April.....	125,854
May.....	291,425
June.....	310,460
July.....	312,735
August.....	327,819
September.....	326,554
October, about.....	310,000

Business, they stated, was quiet in the foundry trade with no prospect of betterment before spring. The foundries in their immediate vicinity seemed to be in about the same condition, only, they were sorry to say, inclined to lower prices, particularly those outside of their city.

The Birmingham Iron Foundry, Birmingham, Conn., were reasonably busy. Orders began to come in about September 1 and they managed to pick up considerable tonnage so that they were enabled to run on full time and have sufficient work ahead to last five or six weeks. There seemed to be a marked falling off in new business in October, still they were hopeful of a gradual improvement. They believed the experience of other foundries in their vicinity was the same.

The Delaware River Iron Ship Building & Engine Works, Chester, Pa., said that while they were uninformed as to the doings of other industries in Chester, they felt safe in saying that, like themselves, they were not overcrowded with work, nor likely to be for some time. If Congress, they said, would take as much pleasure in legislating so that men could have a profit on their products as it seemed to do to the contrary, there would be an encouraging report from their neighborhood. All they could say was that business in their line was dull.

The Abram Cox Stove Company, Philadelphia, reported that in their branch of business trade had been very dull throughout the year; there had been no fat and lean, but it had all been lean without one single streak of fat to vary the monotony. If a certain percentage of the people of the United States had died on January 1 last the business would have shown up, they said, in just about the condition that it is now in. There had been a falling off every week and every month during the year. In regard to the future they believed their trade would share in the general prosperity when it arrived, but they would not attempt to prophesy in regard to the date.

The Johnson Company, Johnstown, Pa., stated that they were quite slack in both foundries. The outlook for winter work was not very promising.

The T. B. Harkins Foundry Company, Bristol, Pa., found that in their neighborhood there seemed to be a tendency to make prices lower and lower, and it seemed almost impossible to build up trade on a paying basis. They were continually in receipt of requests from old customers for lower prices, and business in general was anything but flattering.

J. A. Penton, editor of the *Foundry*, being present was invited to outline the state of the foundry trade as he found it in the territory covered by him, and made an interesting address, from which it appeared that business was in poor shape. Mr. Penton eulogized the work done by the Foundrymen's Association and expressed his belief that much good would result from it.

John Birkinbine of Philadelphia then addressed the meeting. After remarking upon the interesting address made that evening by the president of the association, he instanced the many uses to which iron had been put since 1890 and the vast amount of material consumed in various ways, and which he considered warranted an increased production. Continuing, he said:

Progress and the Decline in Prices.

Some years ago Wm. G. Neilson of this city prepared a statistical chart showing the average prices at which charcoal pig iron sold in Philadelphia in the half century from 1799 to 1849. Omitting reference to quotations for special grades and eliminating the unusually high figures from December, 1814, to June, 1817, and for parts of other years aggregating 42 months when charcoal pig iron commanded \$49 to \$55 per ton, the range of average annual prices was from \$47.50 in 1812 to \$24.50 in 1849 for the best or for No. 1 foundry pig.

James M. Swank, general manager of the American Iron and Steel Association, has compiled an excellent supplement to Mr. Neilson's chart in tables showing the monthly fluctuations of No. 1 anthracite pig iron in Philadelphia from May, 1842, to June, 1894, which demonstrates that the highest average price per month was in August, 1864, \$73.62½, and the lowest was \$12.50, May to July, 1894. The range of annual average prices is from \$59.25 in 1864 to \$14.52 in 1894. While it might be interesting and instructive to supply reasons for the many variations in the quotations my purpose is merely to invite attention to the general downward tendency which has prevailed.

In the interval covered by Mr. Neilson's graphic statement changes in blast furnace practice were few, the application of hot blast stoves dating from the last decade embraced in his statement. The majority of furnaces were using cold blast, and few plants exceeded a product of 100 tons of iron per month. In the decade 1839-1849 anthracite was employed as a metallurgical fuel and anthracite pig competed with charcoal pig, but the anthracite era was just beginning. In the tables which show the prices of anthracite pig iron there are fluctuations up and down as in charcoal pig iron, but the general tendency has been toward a material cheapening of the product.

Many circumstances have aided in this, among which may be mentioned improved transportation, larger and better equipped furnaces, advanced mining appliances, educated management, and active competition brought about by increased demand and augmented output. The blast furnaces of to-day differ greatly from those of 50

years ago. Then water power, which was nearly universally supplied, has given place to massive steam engines. The square structure of stone masonry lined with slate or sandstone has been replaced by iron shells supported on columns and lined with fire brick. Large fire brick stoves heat the blast to 1200° or more and locomotives, cars, and steam handling machinery have displaced many horses, oxen, wagons and men formerly employed. These advances were greatly encouraged by a better acquaintance and interchange of views among those who have been practical managers of our iron works.

Probably an excerpt from a record published in May, 1893, will emphasize the changes which have taken place in pig iron production. This record showed the cost of producing pig iron by the Thomas Iron Company from 1855 to 1892, giving for each six months during that time the average cost per ton of coal, ore and limestone, and the amount of each used, also the cost of each of these components, the labor and supplies entering into the production of a ton of pig iron and the amounts made in each half year. Omitting the extreme high prices which prevailed during the Civil War and at irregular intervals for a short time only the cost per ton of materials used shows but moderate fluctuations. Thus the cost of coal ranged from \$4.95 in 1869 to \$2.36 in 1861 per ton; of ore, from \$4.98 in 1871 to \$2.39 in 1862, and of limestone, from 82 cents in 1869 to 30 cents in 1860 per ton. The quantities of raw materials used to produce a ton of pig iron evidence a material decline; the amount of ore consumed being less, indicates that either richer or better prepared ore was used, the decreased amount of foreign material requiring less flux, while these items added to improved equipment and management permitted of lower fuel consumption and larger product.

Taking the cost of raw materials per ton of iron made, the following will show the range, excluding, as above, the abnormal figures prevailing in boom seasons:

Cost of fuel per ton of pig iron, \$10.07 in 1869 to \$3.48 in 1892.
Cost of ore per ton of pig iron, \$14.21 in 1873 to \$5.34 in 1862.
Cost of limestone per ton of pig iron, \$1.30 in 1869 to 35 cents in 1890-92.
Cost of labor per ton of pig iron, \$8.06 in 1871 to \$2.04 in 1880.

The total expense of producing a ton of pig iron is shown by the table to have varied from \$29.72 in 1873 to \$12.94 in 1892, omitting the extreme cost, such as \$36.07 in 1864.

The general declining tendency is not to be deprecated, for it means true advancement. A blast furnace plant of the present is at a disadvantage if it does not produce as much iron in a day as the charcoal blast furnace of half a century ago made in a month, and some of the larger structures quadruple this output on average working, turning out 2700 and 2800 tons per week per furnace, with occasional spurts exceeding these figures.

The same conditions which have caused a gradual average decline in the cost of pig iron influence the sale of foundry products, and if the records could be collated the economies due to improved cupola and floor practice would be nearly as well marked as those seen in pig iron production. The average purchaser has and probably will continue to gauge his appreciation of the value of castings from the selling price of pig iron. When the metal before

charging into the cupola cost the founder 1½ to 2 cents, or even more, per pound, he was not considered grasping if he asked double or treble these amounts for average castings, and he then could afford, or thought he could afford, to waste fuel in his cupola, stop all work on the floor to assemble men enough to bring from the flask yard a cumbersome drag or flask or to man the winches of the cranes with as many laborers as could grasp the handles. Whether the general proportions of two or three to one in the prices of castings and pig iron prevail you know better than I, but I realize that founders must use improved cupolas, study the fuel problem, employ power cranes, allot piece work, economize labor and even Jew our friend Evans ½ cent on molasses or 10 cents on sand to get a fair return for your capital and energy.

When blast furnaces were scattered and managers seldom met, advances were few; subsequently when furnace plants were located more conveniently to business centers and nearer to each other, the results of personal intercourse were seen in improved structures and practice. But the greatest progress has been since managers, superintendents, engineers and chemists of iron works united to form associations in which the structural and administrative as well as technical problems have been discussed and the results of the meetings published. Pig iron has been made in Pennsylvania for nearly two centuries, but the improvements in furnace output, fuel consumption and control of the character of product in the past 20 years have far exceeded those of all the preceding years. Much of this advance is directly traceable to the interchange of news and the personal acquaintance resulting from association.

This being true of the pig iron industry, similar results may be expected to follow the co-operation of those engaged in the foundries. Specifications for work now detail chemical composition or physical tests. A founder must understand what irons to use as mixtures, and why he uses them. He has not only his fellow iron founders as competitors, but a new generation of those who make steel castings have entered the arena. The shop with a single cupola and a 5-ton hand crane must bid against a plant melting a hundred or more tons of pig iron daily, whose equipment includes heavy power cranes, large cupolas, testing and chemical laboratories, and which can sustain an administrative force of experts in specialties.

Some members of the Foundrymen's Association have operated their plants when the pig iron used commanded double what they now receive for castings, and when the cost of melting, molding and pouring ordinary castings exceeded the rate per pound which the same now command when finished. The present demands close attention to all details, and if we are to progress we may expect a gradually decreasing intrinsic value for iron and steel in all forms, due to improved practice and economical methods. To be abreast of the times one must be conversant with the improvements made. Reading, correspondence, study, experiment and investigation are potent helps, but when the researches and investigations of a number having a common purpose can be discussed and compared progress is the more assured, and such an opportunity appears to be offered in the Foundrymen's Association.

The meeting then adjourned to the

café on the roof of the club, where supper was served. After supper P. D. Wanner, the newly elected vice president, was called upon for an address. Mr. Wanner responded to the call, and in the course of a lengthy address, said that there could be no doubt as to the benefits to be derived from this association. The only thing to be regretted was that the membership had not increased to the extent desired. However, all would admit that they had been a most successful body. They had had reasonably good meetings with good attendances. He had learned more of the foundry business and business in connection with it, and of the iron business generally, since he had been a member than during his 10 or 15 years of active foundry life. That was why he took an active interest in the affairs of the association. He would continue to attend the meetings just as long as the association existed and he was able to attend. The president had that evening spoken of the necessity of associations of this kind. The times and their very civilization demanded it, and if they wanted to keep abreast of the times and their requirements they must band themselves together as they were doing. Associations and combinations for the most part were formed out of necessity, and the necessity in their branch of business had arisen. They might not be able to accomplish in the beginning as much as they would like to, but they were putting themselves in a way to do so. Keep up the association and they would eventually accomplish their ends. He hoped to see an increased membership. It had been said that Philadelphia had more foundries and people engaged in the foundry business than any other city in the United States, and for that reason it was fitting that the work of the association should be carried on from there. They had given up the name they originally held, the National Foundrymen's Association, and had already an off-spring in the Western Foundrymen's Association. He hoped there would be others before long, and that eventually they would all combine and form one general association. Continuing, Mr. Wanner referred to the tariff and claimed credit for Senator Gorman for a tariff bill which cut down the McKinley tariff only one-third instead of two-thirds as was anticipated. The foundry business, he believed, under the new tariff, was not going to be injured, and they would be able to build, buy, sell, and move forward. He predicted peace and quiet legislation for the next few years. Concluding, he said that if business men would become united they would be able to rule politics instead of having politics rule them. Other speeches were made by Messrs. Devlin, Rankin, Register and Riehlé.

Richard H. Edmonds of Baltimore, writing to the *London Times* on the progress of the Southern States in the past ten years, gives some striking illustrations. Fifteen years ago, he points out, the cotton seed was a waste product; now nearly 300 cotton seed oil mills are in operation, representing a capital of \$40,000,000. In 1880 the South mined 6,000,000 tons of coal, in 1893 the output was 28,000,000 tons. Ten years ago the agricultural, manufactured and mine products of the South were valued at about \$1,200,000,000 a year. They are now nearly \$2,000,000,000 and are annually increasing. The railroad mileage has been more than doubled and the traffic

quadrupled. The iron and coal industries and the cotton mills have added nearly \$2,000,000,000 to the assessed value of Southern property, while its banking capital has more than doubled.

The Richards Dinner.

E. Windsor Richards, president of the Iron and Steel Institute, was the guest of a number of American iron masters and engineers, at a dinner held on Thursday, November 8, at Sherry's, New York. Abram S. Hewitt, who had just returned from Europe, was chairman, although not fully restored to good health. His wit and his eloquence as toast master gave spirit to the post-prandial exercises. The guest was welcomed by representatives of the four leading national societies. Dr. H. M. Howe speaking for the American Institute of Mining Engineers, Charles Macdonald, a vice-president, for the American Society of Civil Engineers, Prof. F. R. Hutton, the secretary, for the American Society of Mechanical Engineers, and Joseph Wharton, a vice-president, for the American Iron and Steel Association. Mr. Richards responded and seized the occasion to present to John Fritz of Bethlehem the Bessemer gold medal, awarded to him by the Iron and Steel Institute last year, the recipient acknowledging its receipt in fitting terms. Mr. Fritz is the fourth American who has been so honored, the others being the late Peter Cooper, the late Alexander L. Holley and Abram S. Hewitt.

Some significance has been attached to remarks which fell from Andrew Carnegie, who responded to the toast "Our Bessemer Boys." Mr. Carnegie took occasion to condemn combinations in pretty emphatic terms, stating that in his experience they did more harm than good in the long run. Many of those present regarded this utterance as a warning that Mr. Carnegie does not feel favorable to the continuance of the steel rail pool, of which his firm is now a member. Much merriment was caused by a Welsh speech delivered by T. R. Morgan, Sr., of Alliance, Ohio, who has risen from a colliery lad, injured in a Welsh pit, to the head of one of the most important American engineering establishments. Oliver Williams of Catasauqua, Pa., took occasion to controvert the somewhat gloomy views of the future of the iron trade expressed by Mr. Carnegie. Dr. R. W. Raymond in a witty speech referred to the recent political revolution, while Lieut. W. H. Jaques spoke of the development of modern practice in the manufacture of guns and armor. With rousing cheers for the departing guest and the presiding chairman the company separated.

Among those present were: Watts Cooke of the Cooke Locomotive Works and the Passaic Rolling Mill Company, Paterson; George A. Crocker, New York; George Lauder, Carnegie Steel Company; Jerome Wheelock of Worcester, Mass.; T. N. Ely of the Pennsylvania Railroad; Rollin H. Wilbur of Bethlehem; Jos L. Colby of New York; S. W. Baldwin, Pennsylvania Steel Company, New York; Norton C. Otis of the Otis Elevator Company, Yonkers, N. Y.; R. M. Davenport, A. B. Schropp, Maunsel White and Arch. Johnson of the Bethlehem Iron Company, South Bethlehem, Pa.; Samuel Thomas and Edwin Thomas of the Pioneer Mfg. Company, Birmingham, Ala.; G. G. McMurtry, Apollo Iron &

Steel Company, Pittsburgh, Pa.; W. O. Fayerweather, Passaic Rolling Mill Company, Paterson, N. J.; David Williams, publisher *The Iron Age*; W. H. Wallace of W. H. Wallace & Co., New York; W. G. Park, Park, Brother & Co.; Julian Kennedy, the well-known engineer, Pittsburgh; F. B. Robinson, Carbon Steel Company; W. J. Taylor and H. D. Hibbard, Taylor Iron & Steel Company, High Bridge, N. J.; R. E. Jennings of Spaulding, Jennings & Co., Jersey City; Fred. Gordon, Philadelphia Engineering Company, Philadelphia; J. M. Hartman, the blast furnace engineer, Philadelphia; Col. N. H. Hefft of Bridgeport, Conn.; T. N. Harvey, H. A. Harvey, W. A. Smith, H. Wallis and Everett Frazar of the Harvey Steel Company; J. P. Witherow of Pittsburgh; B. Nichol of New York; Jas. C. Brooks, Southwark Foundry, Philadelphia; J. F. Holloway, Snow Steam Pump Works, New York; C. M. Jacobs, who is well known in connection with the Greathed system of underground rapid transit; Percival Roberts, Jr., Pencoyd Iron Works, Philadelphia; C. B. Dudley, of the Altoona testing department of the Pennsylvania Railroad; Dr. T. M. Drown, Massachusetts Institute of Technology; Frank Firmstone, Easton, Pa.; S. T. Wellman, Thurlow, Pa.; C. H. Morgan, Morgan Construction Company, Worcester, Mass.; George W. Maynard, New York, and C. Kirchhoff, editor *The Iron Age*.

Many prominent men were detained, some of them at the last moment. Among them were Walter Scranton, president Lackawanna Steel & Iron Company; Luther S. Bent, Pennsylvania Steel Company; W. H. Wood, Maryland Steel Company; H. C. Frick, Carnegie Steel Company; E. D. Leavitt, Cambridge, Mass.; Robert W. Hunt, Chicago; Robert Forsythe, Illinois Steel Company; B. F. Jones, Jones & Laughlins, Pittsburgh; Frank S. Witherbee, Port Henry, N. Y.; W. W. Scranton, Scranton, Pa.; Frank Thomson, Pennsylvania Railroad, Philadelphia; A. S. Vogt, Altoona; J. M. Clark, Naylor & Co., New York; Edwin S. Cramp of Philadelphia, Henry Wick and Jos. G. Butler, Jr., of Youngstown, Ohio, and John Thomas of Hokendauqua, Pa.

The poor progress made by the contractor who is building the big dry dock at the Brooklyn Navy Yard is the subject of much complaint on the part of the Navy Yard officials, and the subject is now under investigation by the Secretary of the Navy, with the probability that the present contract will be annulled. The work is now a year behind the contract time, and the commandant of the yard has informed Secretary Herbert that in his opinion the contractor will not be able to finish the dock within reasonable time, if at all. Civil Engineer Endicott has been ordered to the Brooklyn Navy Yard to inspect the work and report on the same to the Department.

The city of Copenhagen, Denmark, has been declared a free port. This action marks the beginning of an aggressive commercial policy by the Danish Government. All tonnage dues on vessels arriving in the port are abolished, and extensive warehouse accommodations are provided to enable shippers to store their goods economically for reshipment and distribution among the other Baltic ports without paying any duty.

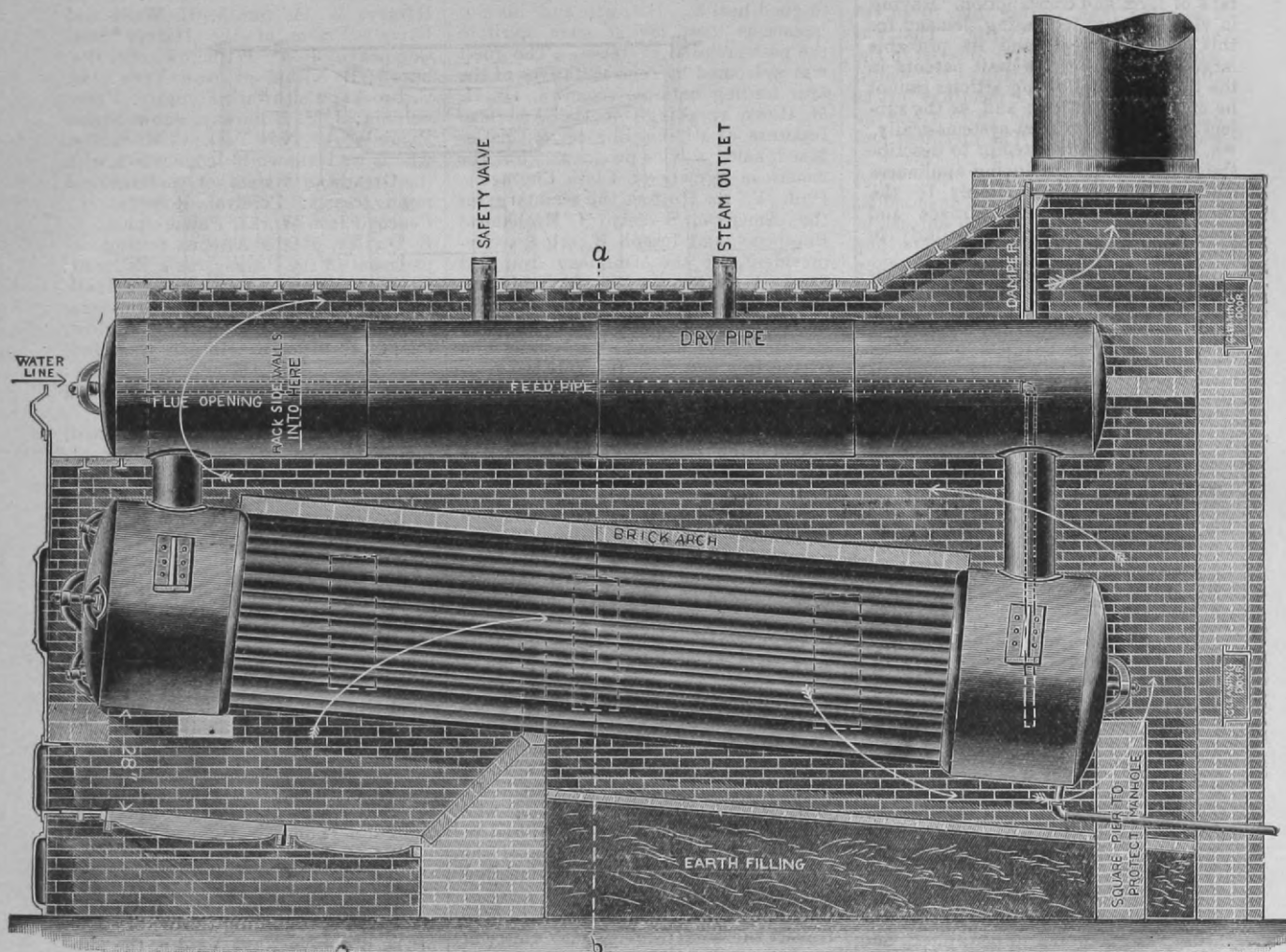
The Wood Water Tube Boiler.

The water tube boiler made by John Wood, Jr., Schuylkill Foundry & Machine Works, Conshohocken, Pa., has been used by several of the large steel and iron plants of this country, and also by electrical power plants and other industrial works. The front or outer head of the tube cylinder is provided with a central manhole 11½ x 16 inches, and with a sufficient number of manholes for cleaning and replacing tubes. The rear tube cylinder is an exact duplicate of the front tube cylinder and is provided with a manhole 11½ x

the products of combustion pass up and around the entire length of the tubes and tube cylinders, inclosed by an arch over the top of the tubes, then back and around the rear tube cylinder and up into a combustion chamber under the steam and hot water drum, then up side flues provided on each side of the front end of the drum in the brick work, along the top of the drum through a flue formed with covering bars and brick, and then to the chimney. Thus all the surface of both boiler and drum is utilized as a heating surface. The water inside the tubes as it is heated tends to rise to the higher end, and as it is converted into steam the mingled

to such a high degree of temperature before delivery to the boiler that the scale making properties contained in the water are mostly separated and deposited in the rear tube cylinder away from the greatest heat and are blown off or cleaned out through the rear manhole, the tube cylinder being large enough for the admission of a man. These boilers are claimed to be particularly applicable for blast furnaces and they will do much more work with less gas than any of the old type.

At a meeting of the National Association of Iron and Steel Workers, held in Youngstown, Ohio, recently, officers



THE WOOD WATER TUBE BOILER.

16 inches in the center of the outer head, thus giving access for cleaning and expanding tubes.

The tube cylinders are connected together by a number of 4-inch lap welded tubes which are expanded in the tube heads and flared over on the inside of the tube cylinders. The boiler is connected to a steam drum above of sufficient size, by riveted oval necks 15 to 18 inches diameter, giving free liberating surfaces.

All of the plates used are of open hearth soft steel 55,000 to 60,000 pounds tensile strength from ¾ to 1 inch thick, depending on the size of boiler. The heads are from ¼ to ¾ inch thick and each boiler is tested at from 150 to 200 pounds pressure before leaving the works. The course of the heat is as follows: The fire is made under the front and higher end of the boiler and

column of steam and water rises through the large vertical necks into the drum above the tubes, where the steam separates from the water and the latter flows back to the rear and down again through the tubes in a continuous circulation, as the necks are large and free. The steam after being thoroughly separated from the water is taken out at the top of the steam drum near the back end through a dry pipe provided on the inside of the drum. The feed is taken up through the center of the steam drum at about the water level, and carried by a pipe of sufficient capacity through the steam to and down the rear neck to within about 15 inches of the bottom of the back tube cylinder. By this means the water is delivered into the boiler at the same temperature as the steam, and by reason of the feed water traveling through the steam brings it up

for the coming year were installed, as follows: Geo. W. Lamoree, New Castle, Pa., president; Chas Phillips, vice-president; P. J. Mundie, secretary, and M. L. Logue, treasurer.

Work on the new battleships "Indiana" and "Massachusetts," at Cramp's shipyard, Philadelphia, is progressing rapidly. In two days of last week the workmen placed in position seven of the heavy 40 ton 18 inch side armor plates of the "Indiana;" 12 of the 20 plates are now in position, 6 more are ready for placing and only 2 remain to be shipped from Bethlehem. The barbettes of the vessel are almost completed. The work on the "Indiana's" armor is regarded by the contractors as being remarkably rapid and satisfactory. The "Massachusetts" is nearly ready for her builder's trial.

Open Hearth Steel.—I.

The principle of alternately storing in accumulators the waste heat of the products of combustion and imparting the heat so saved to the gases and air prior to their combustion is too well known to need description. The Siemens gas furnace is described in numerous contributions to the various technical societies and in all text-books of metallurgy; but these descriptions having more particular reference to the chemical and physical aspects of the furnace, we propose to show our readers a series of drawings and results bearing in a more practical way upon the details of form and construction. Having in view the very increasing demand for this class of steel, and its probable large future under the basic patents in the South, the following articles cannot be made too practical; and, as the subject is too large to treat systematically, we shall omit any attempt to describe the numerous gas producing appliances and confine ourselves simply to the variations of form of furnace and practice which obtain, particularly in Europe.

Like Sir Henry Bessemer in another process, Siemens from the first anticipated practically all the variations in appliances which we now find, and with one or two exceptions there is little deviation from the earliest type of furnace. Perhaps the most pronounced of these is the Lash furnace, which owes its form to the distinctive treatment necessary for natural gas. The early Siemens furnace had a strongly reverberated roof. It was, no doubt, due to this that it had so doubtful a reception from 1865 until about 1880, when larger furnaces and higher roofs came into favor. Indeed, when Frederick Siemens five years later, in 1885, introduced the so-called straight roof with a rather vague theory about "heating by radiation," his researches only confirmed at the time the opinion of many practical steel makers. That opinion was, in a word, that combustion requires a space in which to develop. Imagine a steeply inclined and low roof striking the flame downward upon the cold charge on the hearth and you have two chilling surfaces impeding combustion, the gases passing away imperfectly consumed. The flame produced on combustion is several times the volume of the initial gas and air, and that the chemical action may develop unchecked and completely, it is obvious that the body of the furnace—the combustion chamber—must have sufficient height and length.

The caprice or skill of the engineer, as the case may be, often leads to variations of form, the more successful of which we shall notice. The ideas are confined chiefly to the separation of the regenerators in one form or another from the body of the furnace, to the construction of the gas and air ports, or to the reversing valves and similar appliances. Each manufacturer, looking at his own local conditions, has to make a decision on all these points as they occur, a decision that may or may not turn out wise in the event. In the matter of size, the acid open hearth steel makers, who have fully proved the nature of their fuel, pig iron and labor, who are working on known lines and have no experiments to make, will show by their cost sheets that a plant of eight or ten furnaces should have a capacity of from 20 to 25 tons each. The demands of the works, local conditions, or the nature of the finished product, may justify the adoption of furnaces of

only 15 tons, but outside of such circumstances it is generally recognized that the best size for acid steel is 25 tons.

We confine ourselves in the first instance to a description of the modern Siemens furnace as applicable to either the acid or basic processes, though it should be understood that convenience and economy have necessitated a great distinction and particularly in regard to capacity. We illustrate in Figs. 1 and 2 a 15-ton furnace recently erected in Great Britain which, in spite of some mistakes in design, has worked very well. Fig. 1 is a longitudinal section through the center line of the furnace

not appreciably facilitate repairs and have only the effect of cooling the furnace. There are three air and two gas ports in the block. The two outer regenerator chambers, which ought to be and are, of course, the gas regenerators, are 6 feet 1 inch by 12 feet in horizontal section and communicate with the gas ports by vertical flues in the crowns of the arches, which flues might be brought in considerably with advantage. The air regenerators are 6 feet 10 inches by 12 feet. In neither of the chambers is there any provision for overflowing slag. The roof is reverberated slightly but is fairly high and gives a roomy combustion chamber in

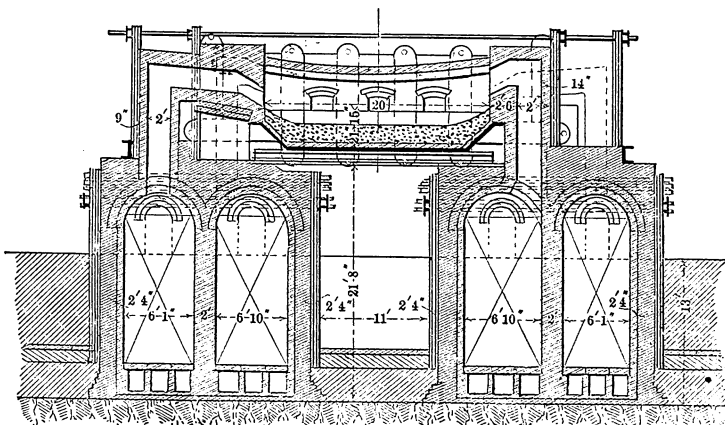


Fig. 1.—Longitudinal Section.

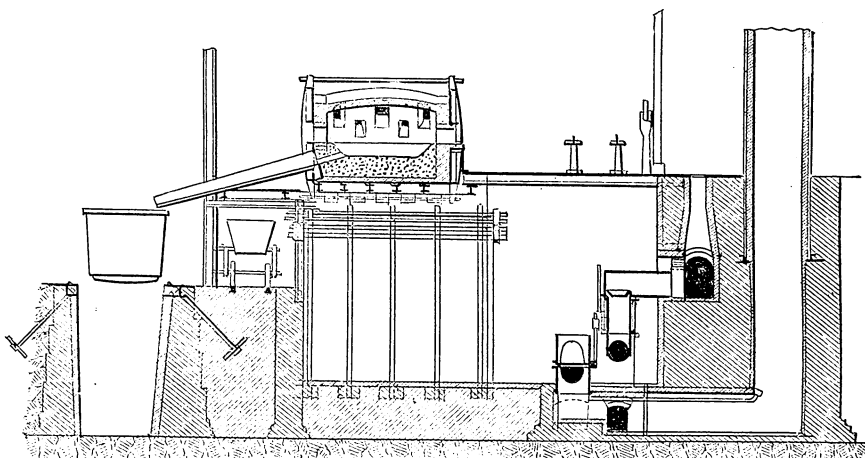


Fig. 2.—Sectional Side Elevation.

FIFTEEN-TON OPEN HEARTH FURNACE.

and shows a hearth 20 feet long by 9 feet 10 inches broad, which rests its weight upon the crowns of gas and air regenerators separated by a broad cooling passage. There is no doubt that this furnace is too long for its capacity and the effect of this is to make the bath of metal somewhat shallow and to expose to oxidation a larger surface than is necessary. That the regenerators should have to carry the weight of the furnace and charge is, of course, faulty in the extreme, but to reduce the first cost such an arrangement is commonly found, and the best thing has been done here in building the furnace on 10-inch beams resting on the thick inner walls of the regenerators and not on the arches. There are three charging and repairing doors on each side, a somewhat unusual and improper provision, for the doors on the tapping side do

which a fine heat and quick melting is obtained. The roof, blocks and top courses in the regenerator filling are of silica brick having the following chemical analysis: Silica, 93.20 per cent.; alumina, 3.96 per cent.; oxide of iron, 0.99 per cent.; lime, 1.16 per cent.; magnesia, 0.39 per cent.; potash and soda, 0.40 per cent.

When this furnace was started, preparatory to making up the bottom or hearth, a coal fire was built on a set of bars resting on bricks laid edgewise on the bottom brick work. The doors were left open and the fire maintained for about four days. The hearth was then cleaned and gas put on quietly for two days, and reversed every half hour until the furnace and regenerators had a fine red heat. As the hearth was now ready to be built a mixture of white sand and loam, in about equal parts, was added,

little by little, during the course of 24 hours, the clay in the loam facilitating the fluxing of the sand, and after about 2000 pounds had been spread over the bottom the whole brick work had run together hard and solid. During the next three days various silica sands were scattered in thin layers over the bottom of the furnace, which was now very hot, and these layers vitrified gradually into a uniform mass, care being taken that there were no hollows. The furnace was then charged slowly with about 1 ton of roll scale and 4 tons of Siemens furnace slag, the greater part of which was absorbed in the course of the 12 hours the operation took. The furnace was now found ready, after a little fettling, for the first charge, which was a light one of about 8 tons, with considerable loss (over 6 per cent.), as was, of course, to be expected. It was soon seen that the furnace worked better from one end than the other, but its behavior and life were very satisfactory, and it was only due to unusual sideways expansion that the roof walls and blocks had to be renewed after the six hundred and sixty-first charge.

Fig. 2 is a sectional side elevation, showing the disposition of the ports, valve pit and valves. The air valves are 33 inches diameter, of the butterfly type. The gas valves are 24 inches, and further control of the waste gases is obtained by a damper in the chimney flue. We shall return later to the subject of valves in general. Each furnace has its own chimney stack—a wrought iron casing, lined with brick work and giving 5 feet clear inside diameter. The distance between the front of the furnace and the edge of the casting pit is about 11½ feet, which permits of a narrow track being laid for running a small slag ladle. This, however, is of little service, and it is almost impossible to keep the road clear.

We shall refer to the working of this furnace in a future article, as we are more concerned at the present moment as to its construction. In this we have already indicated several faults and omissions. A block containing five ports, though still commonly erected, appears to us an unnecessary weakening of the brick work, which wants solidity and support to prevent it from continually falling to pieces and allowing leakage of gas and premature combustion. In this particular furnace some part or other of the block is always collapsing, which is perhaps not entirely due to there being too many small ports, but partly on account of the gas ports being so far drawn back, for they stand 6 feet outside of the air ports. Further, the hot gases do not travel freely between the narrow and comparatively cold walls of these ports. We have also pointed out that the length of this furnace is out of all proportion to its capacity and we shall illustrate several 25 ton furnaces of which the length over all is considerably less. There is no provision made for preventing slag filling up the checker work. However, with all these errors, this, in common with many other furnaces of bad design, works satisfactorily, and the increased cost of repairing the blocks and refilling the regenerators with brick makes only a slight addition to the cost of a ton of steel. In our next article, while still considering the Siemens furnace proper, we shall give instances of better design, with straight roofs, simpler ports and slag pockets.

A telephone system to connect the chief cities of Europe is projected.

Indiana Industries.—II.

Anderson.

The American Wire Nail Company are running their rod mill, wire works and nail factory on full time, turning out a large product. They have just completed an addition to their galvanizing department and can now make 1000 tons per month of galvanized wire for the market.

The Gould Steel Works are now operating the Haugh-Kurtz steel casting plant and are manufacturing the Gould car knuckle or automatic coupler. They are favored above their colleagues in railroad work, having all the orders they can take care of and excellent prospects for the future. This plant no longer makes machinery steel castings, but is run exclusively on the Gould coupler, which is of irregular form and requires much care and skill in the steel melter and molder, but the results are more uniformly satisfactory.

The Anderson Bolt Works of Fowler & Sons are in full operation not having shut down during the panic. The report recently circulated that they propose to build a rolling mill is incorrect. They as well as other consumers of bar iron are evidently in no immediate danger of being compelled to pay high prices.

Thomas C. Fisher, manufacturer of grain cradles and scythe snaths, is operating with only a partial force, not so much on account of slack demand for goods as the very low prices now ruling are claimed to yield no profit to the manufacturer. Mr. Fisher uses Indiana and Illinois ash in making these goods, and his factory is well equipped with mechanical appliances suitable for the several processes necessary. A large stock of goods is carried, enabling him to make prompt shipments on orders.

The Anderson Foundry & Machine Company, whose leading product has hitherto been brick and tile machinery, have made a new departure. They have secured the services of an expert in the manufacture of tinning machinery and are now prepared to take contracts for equipping tinning plants. They will manufacture the Thomas & White pot, tinning rolls, pickling machines, annealing boxes, floor plates, &c. They have already taken some contracts for tinning outfits. Last week they cast their first pot. The company have also decided to build engines up to 40 horse-power, as they find this necessary in competing for trade. For some years past they have manufactured a steam boiler for house heating which has had a good local patronage.

The Porter Iron Roofing Company have quite recently completed a plant for the manufacture of iron and steel sheet roofing and siding. Their products comprise standard crimped roofing, center crimp roofing and siding, corrugated sheets, round and angle ridge cap, standing seam roofing, roll and cap roofing, weather boarding, &c. The plant is equipped with the latest improved machinery for the manufacture of roofing and siding. Power is furnished by a gas engine, which does its work satisfactorily and very economically. The factory is located near the belt railroad which runs around the city, and the company are now putting in their own track to enable them to make direct rail shipments and save cartage. The management of this company is now in the hands of B. H. Gedge, who

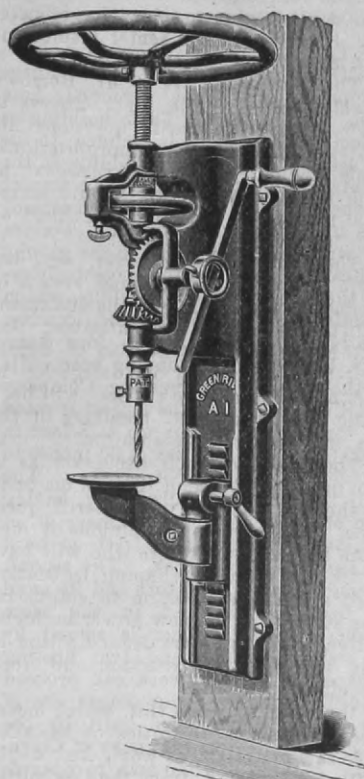
was for years connected with the American Wire Nail Company in an active capacity and who brings to the new concern the advantage of his experience in assisting to build up a great institution from a small beginning.

The Arcade File works are very busy. They have largely increased their capacity within the past two years, partly by the extension of their factory and partly by the introduction of special machinery, which has displaced slower methods. Their machine shop is being driven on more special machines which are intended to still further increase the output and decrease cost.

The Akron Steam Forge Company.

A fine plant has just been completed at Elwood by the Akron Steam Forge Company, who have removed here from Akron, Ohio. Their building is a steel structure and is claimed to be the second heaviest mill building in the country, being surpassed in this respect by one of the buildings at Homestead. The framework is massive and besides the structure is anchored to the ground by heavy stays, so as to successfully resist the force of the high winds, which sometimes play havoc in that locality. The forging shop contains four hammers, the two largest having been built by the Morgan Engineering Company of Alliance, Ohio. The largest is rated at 7 tons and will forge up to 3 feet in diameter. The cylinder is 36 inches in diameter with a 6 foot stroke. The anvil block is unusually heavy, having been proportioned to the hammer at 14 to 1, and the foundations rest on hard pan instead of solid rock. The second hammer is rated at 3½ tons and its anvil has been proportioned in the same manner. Each hammer is served by two swinging cranes and two heating furnaces, so that the work can proceed on either side. These cranes are of new design, and were built by the Phoenix Iron Works Company of Cleveland. It takes but one man to operate a crane and with it he can hoist, lower and rack in and out. The largest cranes are capable of handling 20 tons, yet one man can do this work as easily as though operating a small crane on a light task. The heating furnaces for the big hammer have been built with false fronts, so that whenever it is necessary to take in exceptionally large masses the openings can be enlarged to correspond. The machine shop is in one end of the building, which has been partitioned from the forge shop. It is arranged so that an extension can be built at a right angle to the main structure whenever increased facilities become necessary in this department. It is equipped with large lathes and very heavy drills, boring machines, &c. The largest lathe will turn a piece 47 feet long. A traveling crane covers the entire space of the machine shop, and its track also extends over a railroad track at one end of the shop to facilitate the loading of cars. In all these arrangements the utmost care has been taken to economize labor and expedite production. The power house is in a separate building, and contains six horizontal tubular boilers, which are specially noteworthy in their method of burning natural gas. The fire chambers are built with the usual grate bars, over which is laid a solid bottom of brick laid in mortar. The gas main runs into the chamber below and is then divided into two branches running at right angles to the sides, where the mixers are located for feeding air to the

burners. From each of these two branches 12 goosenecks run up through the side walls of the fire chamber, with their outlets in a straight line. The flames are thus first projected to the center of the boiler and thence travel along the boiler to the draft stack. It is claimed that much greater efficiency is thus secured than when the flame is delivered from the front and strikes the boiler a considerable distance beyond. The arrangement described has the further advantage that in case of emergency the bricks over the grate can be pulled out and coal firing substituted with hardly any delay. These works make marine and locomotive forgings their specialty, but are equipped to turn



The Wiley & Russell Drilling Machine.

out forgings of any character that may be desired. They are well located to reach the Ohio and Mississippi rivers and the great lakes, but also expect to take a share of the trade on the Atlantic and Pacific coasts. A. L. Conger is president; John MacGregor, treasurer; Humphries Miller, secretary, and Charles Rawson, superintendent. Mr. Miller was formerly connected with the forge at Rankin Station, near Pittsburgh, where he acquired his experience in handling very heavy work.

Lack of time prevented the visiting of other establishments in the gas belt, particularly those at Muncie, which are now so numerous that a day or two would be altogether too short to do them justice.

The Wiley & Russell Drilling Machine.

The new drilling machine made by the Wiley & Russell Mfg. Company of Greenfield, Mass., has its feed screw cut in the solid steel of the spindle itself. The feed nut is in the form of a wheel, and there is no feed unless this wheel is checked so as to run slower than the spindle. By applying friction to this nut, or wheel, by means of a brake, the spindle is forced up or down according to the direction in which it is driven. The feed is steady in action, and it has the property of modifying itself according to the resistance of the

material being drilled. For instance, if set to take a heavy cut in steel or wrought iron, it will cut much faster through cast iron and bore rapidly through wood, without readjustment. The friction is still further reduced by the use of ball bearings to take the thrust of the spindle. The drill is lifted quickly from the finished hole by simply turning the crank backward. The left hand of the operator is always free to handle the work.

The Iron Ores of the Mediterranean Seaboard.—III.*

BY A. P. WILSON, ASSOC. M. INST. C. E.,
F. G. S.

Sierra Alhamilla.

There are three principal groups of mines in this district—namely, Los Baños, Alfaro, and Lucainena. The first named is situated about 18 km. in a northeasterly direction from the port of Almeria, at an elevation of 480 m. above sea level, the second is situated about 5 km. to the west of Los Baños, at an elevation of 580 m. above sea level, while Lucainena is 16 km. north of Los Baños and is about 1000 m. above sea level.

The ores are of a similar character in all three groups, being hard red and purple hematite containing 3 to 4 per cent. of manganese; in Los Baños, also, there is a small proportion of ocherous brown ore, which is poorer in iron and more porous in character than the prevailing mass of hematite. The ore bodies occur, as is usually the case with such deposits, between schist and dolomite covered by varying thicknesses of the latter, and in places by a conglomerate of limestone and iron ore. The deposits are everywhere favorably situated for working by open cast, and this is the method of winning adopted. A series of benches are formed 10 to 12 m. apart, the cover is taken off and tipped at the side into deep ravines, while the ore is let down by inclined planes to the ropeway station.

From the port of Almeria there is a railway of 3 feet gauge which extends in a northeasterly direction for a distance of 16 km., having its terminus within 1500 m. of Los Baños mines. These 1500 m. of steep ground are bridged over by a cable tramway, which is on the single rope system, is self acting, and is constructed to deal with 35 tons of ore per hour. The railway is well constructed and equipped, and is capable of dealing with a large traffic.

The Alfaro group of mines are connected with the same railway at a point a short distance below its inland terminus by means of a cable tramway on the double rope or Bleichert system. The length of this ropeway is 5300 m., with a gradient in favor of the load of about 1 in 30. This is scarcely sufficient to make it self-acting; a small engine is, therefore, employed, which is fixed about 1640 m. from the Alfaro mines at a right angle bend in the ropeway, which bend had to be made to circumvent a high mountain in the direct route.

The present method of shipping at Almeria is the same as at Palomares and Garrucha. The ore is tipped onto the beach from the railway wagons and loaded into barges which are rowed to the steamers, which at Almeria can lie within 200 m. of the shore; a steamer carrying as much as 4500 tons of iron ore has thus been loaded at Al-

* Read at the Brussels meeting of the Iron and Steel Institute.

meria. In two or three years' time, however, the harbor which the Spanish Government are building at Almeria, and which is now in a forward state, will be completed, and it will then be possible to load from the mole, alongside which the steamers will lie; for this, the owners of the mines have already obtained a concession.

The Lucainena group of mines has recently been purchased by Bilbao mine owners, and active work has been commenced with a view to opening up the property so as to enable a large output to be dealt with. The new proprietors are setting to work with much energy, and with a determination to develop this property into a very large undertaking. The question of transport for the ore was a serious one; there were several methods practicable; to build a cable tramway to junction with the Almeria-Alhamilla railway, and ship the ore at Almeria; or to construct a cableway or railway to one of the numerous open roadsteads to the east of Almeria. It has finally been decided to construct a railway of 1 m. gauge to Aguas Amargas, a distance of 36 km., or 22½ miles; the surveys have already been made and the preliminary works are being carried out. Aguas Amargas is a small natural harbor between Almeria and Garrucha, and possesses special advantages for shipping, there being a depth of 24 feet of water within 80 m. of the shore. A loading pier is also to be erected for discharging the wagons direct into the steamers, instead of using lighters as at Garrucha and Palomares.

The iron ores of the Sierra Alhamilla are eminently suited for the Siemens steel process as well as for the Bessemer process, their exceptional purity, added to their extreme lumpiness, rendering them formidable competitors of Bilbao Campanil ore. For some years past the ore from Los Baños and Alfaro has been shipped in very large quantities to the Cleveland district, to Scotland and to Wales for use in the Siemens process, for which it has been found very suitable. The ore is mined practically all as lump ore, the only smalls present in the delivered ore being occasioned by breakage in shipment. The surplus ore, beyond the requirements of the Siemens furnaces, is sent to blast furnaces.

The quantity of ore available in the three groups has been variously estimated at 4,000,000, 5,000,000 and 9,000,000 tons.

The following are analyses of the ores from these three different groups of mines:

Description.	Los Baños ore dried at 210° F.	Alfaro.	Lucainena.
	Per cent.	Per cent.	Per cent.
Peroxide of iron.....	74.14	69.69	77.09
Peroxide of manganese.....	5.18	4.07	6.82
Oxides of lead, copper and zinc.....	nil.	nil.	nil.
Alumina.....	1.54	0.00	0.00
Magnesia.....	1.73	4.08	0.72
Lime.....	1.81	6.25	2.04
Silica.....	5.50	2.23	5.44
Carbonic anhydride.....	1.60		
Sulphuric acid.....	0.05	0.00	traces
Phosphoric acid.....	0.02	traces	traces
Arsenic.....	nil.		
Combined water.....	7.71		
Loss by calcination.....		18.44	7.94
Total.....	99.91	100.00	100.05
Metallic iron in the dry.....	51.90	48.78	53.96
Metallic manganese.....	3.27	2.95	4.81
Moisture.....	1.78		

These mines are only in course of being opened up, but as this is being carried out with much energy it may be expected that the output from all of them will soon be very largely in

water containing much oxygen and no lime salts. The bar gradually rusted, but the corrosion ceased when the oxygen was used up. The bar was then removed, repolished and put back, after

	Alfaro.	Los Baños.	Lucanena.
	Pesetas.	Pesetas.	Pesetas.
Working and delivery to cable.....	1.500	2.125	2.000
Transit by cable to railway.....	0.375	0.125	} 2.500
Railway carriage to Almeria.....	1.250	1.250	
Loading into steamers.....	1.600	1.600	
Royalty.....	1.000	1.000	1.000
Management and sundries.....	0.625	0.625	0.625
Totals.....	5.750	6.125	6.125

At the current rate of exchange these are equal to about 3 shillings and 5 pence, 3 shillings and 7½ pence and 3 shillings and 7½ pence per ton.

creased. The costs of working and putting the ore on board ship at Almeria are shown in the accompanying table.

The Pitting of Boilers.

In an article recently published, M. Olroy, a French engineer, gives the result of his investigation into the pitting of boilers. Pitting is particularly likely to occur if a water very free from lime is used in a clean boiler. The pits take the form of conical, or more frequently spherical, depressions, which are filled with a yellowish brown deposit consisting mainly of iron oxide. The volume of the powder is greater than that of the metal oxidized, so that a blister is formed above the pit which has a skin as thin as an egg shell. This skin contains usually both iron oxide and lime salts, and differs greatly in toughness. In many cases it is so friable that it breaks with the least shock, falling to powder, while in other cases the blister detaches itself from the plate as a whole. An analysis of the powder in the pits showed it to consist of 86.26 per cent. of peroxide of iron, 6.29 per cent. of grease and other organic matter and 4.25 per cent. of lime salts, the remainder being water, silica, aluminum, &c. The skin over the pits was found to contain 38 parts of calcium carbonate, 12.8 parts of calcium sulphate and 32.2 parts of iron oxide, with about 8 per cent. each of magnesium carbonate and insoluble matter. Feed heaters often suffer badly from pitting, particularly near the cold water inlet, and in boilers the parts most likely to be attacked are those where the circulation is bad, especially if such portions are also near the feed inlet. In locomotives the bottom of the barrel is most frequently attacked, and the largest ring. The steam spaces are generally free from pitting, unless the boiler is frequently kept standing with water in it. As the water evaporates, pitting is then likely to occur along the region of the water line, a part which in a working boiler is generally free from attack. This is especially the case if longitudinal joints of the boiler are liable to be exposed by the evaporation of the water and to form a ledge on which moisture can rest. When a boiler forms one of a battery and is kept standing for a long interval, the top of the boiler is liable to pitting. Steam finds its way into it and condenses on the roof, causing bad pitting there. Perfectly pure water containing no air does no harm, and steam alone will not cause pitting unless it gets a supply of air. The Loch Katrine water of Glasgow, which causes pitting on clean boilers, contains much gas. MM. Scheurer-Kestner and Meunier-Dolfus inclosed a polished iron bar in a natural

which it remained perfectly bright. Repeating the experiment with water containing lime the rusting was much less complete, the lime salts forming a protective layer on the iron, but on polishing this off corrosion recommenced. In distilled water the bar remained quite bright. The corrosion is much more rapid if the water contains carbonic acid gas as well as oxygen. In this case a voltaic action takes place. The rust first formed is electro-positive to the iron, which then dissolves away, decomposing the water. It is for this reason that in cases of pitting it is essential that all traces of the iron peroxide should be cleaned from the metal or the rusting will continue.

Industry of San Francisco says: "There is a good deal of difference between making the details of a war ship and assembling one. The Union Iron Works here is about the only place in the world where a ship is wholly produced in the works. The "Oregon," for example, contains 120 steam engines, every one of which was made in the Union Iron Works, while the sister ship, constructed by the Cramp Company, at Philadelphia, contains 72 engines made by other firms. Not only this, nearly all the steam and water fittings, the whole of the hydraulic apparatus, and indeed nearly every detail of all the ships built here are produced in the works at the Potrero. Even the electric lighting plant was put in by the contractors, who purchased only the dynamos and other elements that could not be produced by the resources of their own establishment. This is a very important fact in respect to the Union Iron Works, and indicates an ability of staff, plant and administration without parallel."

During a single month the Western branch of the Hartford Steam Boiler Inspection & Insurance Company inspected 13,391 steam boilers and found 11,308 defects, of which 976 were dangerous. The most important defects were the following: Incrustation, 1903; internal corrosion, 630; deposit of sediment, 840; defective riveting, 1600; leakage, 1656; defective gauges, 525, &c.

In order to meet the competition of tin plate of home manufacture in the United States market, the Welsh tin plate manufacturers are about to demand a reduction of 25 per cent. in the wages of their workmen.

The French Government has decided to construct an important new military and naval station with a port capable of accommodating the largest ironclads, at Port-en-Bessin, between Havre and Cherbourg.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., November 12, 1894.

There is much speculation already as to the chairmanship of the Ways and Means Committee in the Fifty-fourth Congress, which will change front so radically. There is no question that ex-Speaker Reed will drop the ex within 60 minutes after Clerk Kerr finishes calling the names of Representatives who have been certified to him and have been placed on the official roll, and the House of Representatives begins to elect its officers. Mr. Reed is now the senior member of the minority of the committee.

The next on the list is Mr. Burrows of Michigan. While Mr. Burrows is well booked on tariff questions his tastes incline him to appropriations. This would leave Mr. Payne next in line if the new speaker should adopt that method of selecting the head of this important committee.

There are many, however, who believe that the overwhelming results in Pennsylvania should give the chairmanship to one of her Representatives. She will have the largest number of Representatives (28) in any one delegation in the new House. New York will be a close second with 27 members of the majority in her representation.

There is also much discussion as to the probable course of the new majority in the next Congress on the tariff question. A consensus of opinions of men both here and elsewhere who will have much to do with shaping legislation indicates a determination to emphasize the attitude of the new power in legislative affairs by some defined action in the direction of protection and reciprocity.

In order to reach this, which means the restoration of duties on so-called free raw materials, as wool, &c., a bill will be reported from the Committee on Ways and Means to that effect, with some modifications as to certain articles. It will not be a revival of the so called McKinley bill, but a measure which will give ample protection to manufactures which come into competition with American articles and a minimized rate as a safe security against the fluctuations of foreign cost of manufacture and prices on articles between which the cost of the foreign and the American product is equal.

As the effort will be to build up and strengthen confidence in the mechanical and all other branches of industry, it is expected that such a movement will stimulate enterprise and hold public sentiment in line for the battle for executive control in 1896.

It is expected that the President will veto such a measure as will emanate from the Fifty-fourth Congress. The majority in the lower branch will be able to pass the bill over the veto. In the Senate this will be impracticable, but the issue on this subject will then be clearly defined for 1896 and the people, the tribunal of last resort, will be able to pronounce their verdict, which will hold for many years to come.

The spirit of revenge to be taken in parliamentary form which is here and there manifested by the repudiated champions of tariff reform, alias free trade, need not alarm the manufacturers in their plans for enterprise and business in the immediate future. The coming session will not be over 70 working days net in length, which de-

ducts the Christmas holidays and Sundays. Every moment of the brief space will be taken up in passing the 14 appropriation bills. On some of these there will undoubtedly be a contest, particularly on the subject of additional ships for the navy. The policy of the present minority has been to go on with this work to the extent of authorizing two or three battle ships, a few cruisers and torpedo boats by every Congress.

As already announced in *The Iron Age*, within the next year practically all work in naval construction will cease and with it, therefore, a healthful Government demand for iron and steel. The vital importance to any first-class nation of a powerful modern navy in these days has been amply demonstrated in a small way by the pending conflict between the greatest of the pagan powers of the distant Orient.

It is further not improbable that the controversies over such items for the increase of the field of industrial activity may cause one or two bills to fail of passage within the constitutional limitation of the Congress. This would force the President to summon the new Congress together in advance of its regular meeting in December, 1895.

The admirable annual report of Commodore Sampson, Chief of the Bureau of Ordnance, United States Navy, is the theme of the highest praise from officials of the Department of Naval Experts. It is a clear and comprehensive practical document and has enlisted the closest attention of the Secretary of the Navy, particularly in its presentation of certain features of the ordnance problem and the recommendations for the future.

Much of the statistical and some of the other portions of the report have been presented in a conversational way in *The Iron Age*, but the document itself enters more elaborately and officially into these subjects.

The contracts for 453 sets of gun forgings have been practically filled. Of this number 340 guns are completed and of these 232 are afloat.

The Commodore shows that experience has demonstrated that the system of building up guns is the best, but the forged steel tube reinforced by wire will make an efficient and cheaper gun and one which might be utilized for quick production in event of an emergency. He maintains in his report, as he has in conversation with the representative of *The Iron Age*, that to this date the assembled and wire guns are the only ones which come up to the standard of all the requirements of a modern high power gun.

The Commodore also gives official utterance to another feature of a wise ordnance project, the continued active manufacture of guns of all calibers, which can be used for the ships to be constructed in the future and constitute a liberal surplus stock for the emergencies of war, the losses by damage or other causes in peace, and also a supply for the improvised vessels of war drawn from the merchant fleet. The Commodore believes in this work being done as at present, the forgings by contract and finishing and assembling in the Government gun foundry. He has confidence that the present type of guns will not become obsolete.

His reference to the cases of deception practiced by certain concerns in castings and treatment is in favor of rigorous prosecutions, but he attributes these transactions due possibly to the extreme competition in manufacture. He has not lost faith in the present system of inspection, but admits indirectly that it might be improved.

The reference to the completion of the contracts for the supply of projectiles was anticipated in *The Iron Age* some weeks ago. The 13-inch guns will need a supply of common shell, for which proposals will be asked very soon. The Johnson cast steel shell is regarded as equal to these requirements. The Commodore expresses the opinion that a cast steel shell of treated material will be produced, from present indications, fully equal to those of forged material, which are very expensive. The total orders for armor piercing shells aggregated 9722. About 150 still remain to be completed. The companies furnishing supplies were the Carpenter, Sterling and Taylor Iron & Steel companies, and the United States Projectile Company. The projectile plants of these four great concerns are practically at a standstill. The Commodore urges the manufacture of a liberal reserve supply in order to get a stock on hand and keep these plants in efficient shape.

The tests in ordnance are given with much detail. *The Iron Age* has already presented the results in current form as submitted in official reports, and they therefore need not be repeated. The expert opinion, however, of Commodore Sampson, as to the relative merits of American armor, is that Harveyized steel armor plates are without a rival in the world, and "that notwithstanding attempted frauds the ballistic tests have prevented the acceptance of inferior plates." An appropriation of \$500,000 is asked as a beginning for the manufacture of armament for the American liners, under the United States mail contract statute. It is estimated that 323 guns, 4 to 6 inches caliber, and 377 rapid firing rifle guns will be required for 33 such vessels on the Atlantic and eight on the Pacific coasts.

The report on the trial of rapid fire guns was given *in extenso* in *The Iron Age* at the time. Aggregately the report of Commodore Sampson for 1894 shows flattering progress in the production of armor and ordnance, and a liberal policy by Congress will make the achievements in this line of warlike preparation in time of peace on this side of the Atlantic even greater in the future than can be attained on the other side except by imitation as a means of keeping pace with the United States.

THE WEEK.

The estimates of the Naval Ordnance Bureau for the coming year call for an expenditure of nearly \$7,000,000, of which \$5,237,670 is for the armament of vessels already authorized, and \$25,000 for arming and equipping the naval militia.

The railroads in Indiana, Illinois and Ohio are said to be experiencing great difficulty in filling the demand for freight cars, more especially stock and coal cars. The demand from shippers is referred to as showing an extraordinary increase since election.

Grand Chief Arthur of the Brotherhood of Locomotive Engineers has voluntarily withdrawn his appeal from the injunction issued against him by Judge Taft on the application of the Toledo, Ann Arbor & North Michigan Railroad Company compelling him to rescind his order to the members of the brotherhood in the employ of the company to refuse to haul their cars, and restraining him from issuing any further order of a similar nature. This ends a long

litigation in the matter of the famous Toledo & Ann Arbor boycott.

The new Anglo-Japanese treaty throws open the whole of Japan to British trade and industry. Hitherto foreign trade has been confined entirely to a limited number of treaty ports, and foreign merchants have been hampered in their business by many vexatious restrictions.

Texas cotton growers have decided not to sow any more than one-half this year's acreage of cotton next season, owing to the present low selling price of cotton, which, they claim, is from 1 to 2 cents a pound below the cost of production.

Victor de la Cordova, a New York exporter, has been held by the Federal Grand Jury in \$25,000 bail for placing cartridges among barrels of tallow shipped in the Ward Line steamer "Yumurri" for Havana. It is said that the Ward Line owners attribute the disasters to their other vessels during the past year to a similar source.

The Government crop report for the month of November makes the average yield of corn, per acre, 19.7 bushels, which is about 1½ bushels above the yield estimated under the figures for October. This is the lowest yield in 13 years—that of 1881 standing at 18.6 bushels per acre. Last year the average yield was 22.5 bushels, on a much larger acreage. The cotton returns show an improvement as compared with those of last month, 191.7 pounds per acre being the indicated average yield for the entire cotton belt.

The Texas Cotton Palace, at Waco, Texas, was formally opened on November 8.

Application is to be made to the Dominion Parliament to incorporate a company to build a trans-Canadian railway from Quebec to Fort Simpson on the Pacific Coast.

The combined manufacturers of Cincinnati and its neighborhood have issued a general call for a convention in that city on January 22, 1895, to form a National Manufacturers' Association. The purposes of the proposed organization, which is to be of a non-political character, will be to secure wholesome legislation for the encouragement of manufacturing and to stimulate favorable trade relations with foreign countries.

Superintendent Hannan of the New York State Department of Public Works, has ordered that the Erie, Champlain, Black River, Oswego and Cayuga and Seneca canals be closed for the season on Friday, November 30, at midnight, unless sooner closed by ice.

The second attempt to carry out a speed trial of the new United States torpedo boat "Ericsson" was defeated on Monday by another breakdown in her machinery just after she had started on her trial trip. The eccentric strap of the port engine broke while under full headway. Professional opinion tends to the belief that the "Ericsson's" castings are too light for high speed in rough weather. This, however, is no fault of the builders, they having been made according to the Government specifications.

The fall of Port Arthur, on November 11, after a short attack by the Japanese forces probably means the beginning of the end of the struggle in the East.

The Iron Age

New York, Thursday, November 15, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

The Future Development of the Iron Industry.

We have observed that figures have been presented repeatedly of late bearing on the development of the production of iron in this country since 1880. Sometimes the statistics are quoted to prove how wonderful has been our material progress, and at other times they are used to give emphasis to a warning that our pace has been too rapid. Francis Schuman, president of the Foundrymen's Association, quotes the figures in his address before the annual meeting of that body. His interesting remarks will be found in another column. Incidentally he notes that the production of pig iron, which was 4,114,254 tons in 1880, rose to 8,279,870 tons in 1890, thus increasing 100 per cent. in ten years. Now, when a comparison is made with the increase in population in that time, it does look as though we had been going along at a pace which we cannot well maintain.

So far as the past is concerned one point is neglected. We then imported quite a good deal of iron and steel in the heavier forms. For that reason a more rapid expansion in domestic production was warranted. So long as the country was not covering its own requirements the rate of progress was not excessive. We go even a step further and hold that development was inadequate so long as it allowed of the importation of large quantities of goods in times of a suddenly expanded demand.

A comparison of product alone is not fair, because it entirely ignores these imports. It is a particularly unhappy omission in the case of the year 1880, which was one of abnormal consumption. In that year we imported 754,657 tons of pig iron, 112,456 tons of bar iron, 86,486 tons of iron rails, 66,304 tons of steel rails, 631,690 tons of scrap iron and 169,287 tons of tin plates. With additional quantities of plates, hoops, sheets and chains, the total tonnage was 1,849,034 tons, as compared with 250,593 tons in the fiscal year 1879. In addition thereto we imported \$4,598,407 of steel ingots and billets in 1880, as compared with \$1,281,942 in 1879. Here we have a demand not represented in the production statistics equal to about 2,000,000 tons of pig iron. If any one had argued in the seventies that the American production was proceeding too rapidly, would not subsequent events have floored him?

Our make of pig iron jumped from 1,865,000 tons in 1870 to 4,295,414 tons in 1880. It more than doubled, and yet the large make of the latter year was millions of tons behind the boom requirements.

It is true that we have very little left to conquer so far as our market is concerned, and therefore our future rate of progress ought to be slower. As an offset to that, however, we can hope for a largely increased consumption of metal created by the low prices prevailing. And then, too, who feels safe enough to deny the prediction that in the next decade we shall become heavy exporters of iron and steel? The present is not the time likely to foster sanguine views as to the future of one of our great industries. Yet we do believe that this country will not abate much its rate of progress in that field.

Our Human Machines.

The comfort of workmen is a matter to which a great deal more attention could be given than it at present receives. It is true that the question is not wholly neglected when new factories are built or old ones are remodeled. Here and there employers can be found with hearts big enough to consider that the health and comfort of their working people are worthy subjects for their careful contemplation, and pursestrings are loosened a little more to enable improvements to be made directly for the benefit of the man at the bench, lathe or rolls. But these instances are altogether too rare. When a new mill or factory is being designed, the highest talent will be employed and the utmost pains taken to secure the best type of building for the purpose. Foundations will be most carefully looked after, the character of the building will be very elaborately studied so as to provide safeguards against possible disaster from overloading or damage by fire, and the arrangement of the machinery will take the most anxious thought. In these days of small margins labor saving devices will be studied in every direction, and the highest development of human ingenuity will be called into play to reduce loss of time in every direction, as well as to secure expansion of output. All these details, and more, receive anxious attention, but the best machine after all, the human machine, is too frequently left to shift for itself, with no special care. The human machine, while it is capable of withstanding very rough treatment with no immediately perceptible ill effects really needs better care than any other part of the machinery in the shop. It needs ventilation, protection as far as possible from drafts and overheating, proper warmth in winter, facilities for promoting cleanliness, and sanitary comforts. The greater part by far of a workman's waking hours is given to his employer, and there is no doubt that this part of his life could be made much more pleasant than it

now is. Perhaps if this part of the factory machinery were more carefully looked after the other part of the machinery might be found to work better also. Even if this is not the case there is nevertheless a duty resting upon the employer to do his best in this respect.

Occupations innumerable can be found in which the workmen cannot be made comfortable while performing their tasks. It would be impracticable to attempt it. Yet, even in these cases the works would be less uninviting if a man were given an opportunity to wash up before he left the place to go home. It would be still better if he were also furnished with a locker in which to keep some slight change of clothing and thus present a somewhat tidy appearance when on his way to and from work. Smutty faces and grimy hands and soiled clothing are not badges of dishonor, but they might be left at the gates of a rolling mill or the mouth of a mine or the door of a factory without detracting from the standing of a workman, but adding very much to his self respect and to the pleasure and esteem of his waiting family. In the matter of sanitary conveniences especially too little care is exercised. Horses are stabled with as much regard for their comfort as is paid to workmen in this respect. When a mill or other manufacturing establishment is erected at a cost of thousands of dollars or hundreds of thousands, it seems pitiful that a few hundred dollars could not be spared to provide sanitary conveniences of a comfortable and cleanly character. In these days water closets and the requisite plumbing work are not costly, underground drainage can be easily arranged, and water for flushing is always available from the supply tanks. Why should the most primitive methods still be found in use, creating disgust whenever a resort to them is necessary, and perhaps injuring the health of those who are obliged to work in their vicinity? The employer to-day, more than at any time in the past history of the world, can affirmatively answer the question, "Am I my brother's keeper?" He is, and it is incumbent on him to treat that brother as well as possible.

This seems to be an excellent field for the exercise of practical philanthropy. A fine library building in a manufacturing town is a most desirable institution. It is well to attempt to lead the minds of workmen and their families beyond the mere contemplation of their surroundings, and give them an opportunity to enlarge their powers and breathe the atmosphere of something else than a material life, but the library building should follow the establishment of good wash rooms and toilet rooms at the works. There is where the care of a workingman should begin, in the promotion of his comfort and in ministrations to his absolute personal necessities. The endowment of institutions of this character should precede the endowment of a library by all means.

The U. S. Torpedo Boats.

There is a marked difference in the most essential features of the torpedo boat "Ericsson," which is now awaiting her trial trip, and the torpedo boats 3, 4 and 5, for which plans and specifications have been drawn by the Bureau of Steam Engineering. The boats of new design are slightly larger in all dimensions and the power and speed are greater, the increase being as follows: Length on load water line, 10 feet; beam on load line, 6 inches; mean draft, 8 inches; displacement, 15 tons; horse-power, 200; speed per hour, $\frac{1}{2}$ knot; coal capacity, 10 tons. There is also a corresponding difference in the weights of the hulls and machinery of the two designs. But we find that the most important changes have been made in the engines and in the position in which they are placed in the hull. The engines of the "Ericsson" are of the quadruple expansion type with cylinders $11\frac{1}{2}$, 16, $21\frac{1}{2}$ and 30 inches in diameter, by stroke of 16 inches. The engines of the new design are four-cylinder triple expansion, the diameters being 12 inches for the high pressure, $19\frac{1}{4}$ inches for the intermediate and 22 inches for each low pressure, the stroke being 16 inches. The four cylinders were adopted instead of three, in order to secure a better running balance and thereby reduce vibration as much as possible. To still further insure this quality, the high and intermediate pressure cranks are placed opposite each other, as are the two low pressure cranks, and the pairs are placed at right angles to each other. In addition, the weight of the reciprocating parts has been reduced by the employment of hollow piston and connecting rods. Another consideration influencing the adoption of this type of engine was its lightness and compactness and to avoid the large low pressure cylinder of the quadruple expansion engine.

The cylinders have been placed as close together as possible, and the steam chests, instead of being located between the cylinders, as in the "Ericsson," are on the sides of the cylinders. In the "Ericsson" engines the valves are all of the piston type except that for the low pressure cylinder, and they are operated from eccentrics on the main shaft, the reversing being obtained by a link motion. In the new engines the valves are all of the piston type and are actuated from a secondary shaft placed parallel with and driven from, and at the same speed as, the main shaft. The engines are reversed by the fore and aft movement of a spirally grooved sleeve, which is so arranged as to change the time of throw of the valve rods.

A conspicuous departure has been made in the arrangement of the engines in the hull. In the "Ericsson" they are placed side by side, only a passageway separating them, and with the high pressure cylinders forward. In the later boats each engine is placed in a compartment of its own, the starboard

engine being in a compartment forward of the other. The high pressure cylinder of the starboard engine is aft while the high pressure cylinder of the other is forward. All the auxiliary machinery of one engine is placed in the compartment of that engine. One important consideration influencing this arrangement is that the chances of the boat being completely disabled by an unfortunate shot are reduced to a minimum. The wrecking of one engine would leave the other fit for service. But where both are placed in the same compartment the destruction of one would mean the ruin of both. Another and by no means minor advantage of this arrangement is the ease and safety with which the engines can be attended to when in operation. The narrow passageway dividing the quickly moving engines of the "Ericsson" is a source of danger, as a careless movement risks life and limb. The engine and boiler spaces of the "Ericsson" measure $61\frac{1}{2}$ feet in length, the same spaces in the others being $64\frac{1}{2}$ feet. In both the "Ericsson" and later vessels one boiler is placed both forward and aft of the machinery spaces.

The foregoing brief outline may be considered as showing the more important changes it has been thought desirable to make in designs for torpedo boats. In other words, it practically illustrates the results of the study by the naval authorities of this type of vessel since the plans for the "Ericsson" were drawn. The changes appear to have been wisely made, particularly those governing the placing of the machinery in the hull. So also would appear to be the adoption of a four-cylinder triple expansion engine with the cylinders in line and not separated by the steam chests.

Drawback Payments.

The Bureau of Statistics has just issued a statement prepared by the Commissioner of Customs which gives the amount of drawbacks of duties paid on exported articles manufactured from imported materials. It appears that the sums so paid were \$4,911,189.54 in the fiscal year 1891, \$3,410,736.88 in 1892, \$3,390,977.14 in 1893 and \$4,303,976.05 in 1894. In the first year mentioned sugar drawbacks figured up to \$2,717,298.62. In 1892 these dropped to \$239,458.37 and have since become insignificant. This leaves us the really important item, that of tin plate, on which the drawback payments were \$1,418,496.15 in 1891, \$2,342,983.74 in 1892, \$2,650,792.55 in 1893 and \$3,523,094.35 in 1894. These figures are interesting as showing how large a quantity of the tin plate imported into this country goes out again. Of course, the bulk of the material is used for making cans for the export oil trade, the Standard Oil Company being the chief beneficiary.

The total imports of tin plate in the fiscal year 1893 were 628,425,902 pounds. Of this, 1,219,357 pounds was re-ex-

ported, while 121,708,890 pounds was sent out under the drawback arrangement, thus leaving 505,497,655 for domestic consumption. In 1894 the imports fell off to 454,160,026 pounds; the re-exports dropped to 716,461 pounds, but the drawback exports rose to 161,757,907 pounds, so that the quantity taken by our markets of foreign plate declined to 291,585,658 pounds, a shrinkage of over 200,000,000 pounds in one year, due, of course, chiefly to the general depression of business.

In all the other branches of the iron and steel industry the volume of business done in converting foreign raw material into goods for the export trade is of relatively little consequence. The entire sums paid under the drawback system for iron and steel in various forms were \$163,867.62 in 1891, \$157,501.60 in 1892, \$248,952.71 in 1893 and \$209,490.93 in 1894. In some lines, like in the wire trade and in cut nails, the lowering of the price of domestic material has rendered the use of foreign unremunerative. That is the case, for instance, with foreign steel billets or wire rods and with slabs.

The reduction of the retention by the Government to 1 per cent. of the duties collected does not appear to have had any stimulating effect.

There seems to have been some misapprehension concerning the freight rates on foreign tin plate to interior points which we published in the last issue of *The Iron Age*. The practice is to make a through rate of freight to points of destination. The figures which are published represented the proportion which the American carriers obtained of the whole rate. Sometimes the carriage in this country is by water, sometimes by rail and water and sometimes by all rail. The freight rates, of course, apply only to larger quantities, and the rates on foreign plates which are shipped from warehouses by New York importers to interior points in small quantities pay the local rates. It practically gives the interior jobber control of the distributing trade of the interior. We may note in this connection that since last week the low through rates from Great Britain to interior points have been withdrawn. As yet the new figures have not been announced.

PERSONAL.

John W. Evans, formerly connected with the Youngstown Rolling Mill Company, Youngstown, Ohio, has been appointed general manager of the plant of the Sharon Iron Company, Limited, Sharon, Pa.

John Platt has opened an office, as consulting and contracting engineer, in the Electrical Exchange Building, 136 Liberty street, New York. He will give special attention to hydraulic machinery, adapting to American requirements the well-known specialties of Fielding & Platt, Gloucester, England. Mr. Platt expects also to aid American builders of machinery to introduce their appliances and inventions in England,

in co-operation with his father, James Platt, of the Gloucester firm mentioned.

Jas. R. F. Kelly and Gustav Triest have formed a partnership under the name of Jas. R. F. Kelly & Co., engineers and contractors, with offices in the Havemeyer Building, New York. Mr. Kelly has until recently been partner of Joseph Edwards & Co., machinists, of New York City, and Mr. Triest has been assistant to Alfred P. Boller for the past five years.

The Cornwall Ore Hills—II

BY JOHN BIRKINBINE, PHILADELPHIA.

The Furnace Interest.

Up to the year 1894 the entire 96 parts going to make up the total of the Cornwall Ore Banks Company were held by descendants either of Peter Grubb or Robert Coleman, and except the 15½ parts purchased by the Lackawanna Iron & Steel Company all of it is still held by members of these families. What influence will follow the introduction of a partial ownership by parties who are not united by ties of consanguinity or separated by the difference too common to such relationship is exciting considerable interest, particularly as the new owner is not an individual, but a corporation with ample capital, and one which has been eminently successful in a business of magnitude. The Lackawanna, Iron & Steel Company own blast furnaces at Scranton, and with the purchase of the interest in the ore hills they obtained two stacks at Cornwall which require reconstruction, and two at Lebanon of more modern equipment. One of the latter is now being reconstructed.

Owners of interests in the Cornwall ore hills are proprietors in whole or as partners of, or lessees of, all the furnaces above mentioned as using Cornwall ore, and of other furnaces, but nearly one-half of those who may be considered as proprietors of the ore hills have no personal interest in the operation of blast furnaces. While the demand for Cornwall ore was active it was supplied to numerous customers, but its utilization was undoubtedly affected by two rates which were in use—viz., the general rate, or the price at which the ore was sold in the market, and the proprietor's rate, or the reduced price at which the owners obtained ore for the furnaces with which they were connected. At present there is no open rate, the users of Cornwall ore being practically confined to the proprietors and the Robersonia Furnace Company, the proprietors' rate being based upon the selling price of Bessemer pig iron made from the ore. To explain, the present proprietors' rate approximates \$1 per ton of ore, and the average annual product of the mine may be taken as 480,000 tons, or say 5000 tons per share. In 1893 the output was 439,705 gross tons.

The net cost of mining and delivering to either railroad leading from Cornwall may be placed at 30 cents per ton, therefore at the above proprietors' rate the Cornwall Ore Bank Company receive as royalty or profit 70 cents per ton, and the more ore the Ore Bank Company mines the greater will be the income from this source to those who have no interest in blast furnaces. That is, the owner of one share in the ore banks would receive annually on the

above basis \$3500 if not interested in a blast furnace. But if said proprietor operated a furnace, he would pay \$5000 for 5000 tons of ore, and receive as his proportion of royalty and profits \$3500, making the net cost of 5000 tons of ore to him \$1500 plus freight. If, however, he consumed 10,000 tons he would pay to the Ore Bank Company \$10,000 and receive back \$3500, his ore in one case costing 30 cents and in the other 65 cents per ton, plus freights. If the owner of one share used 20,000 tons of ore, the net cost at above rates would be 82.5 cents per ton.

Cost and Quality of Ore.

Either of these costs seems remarkably low, but it must be remembered that, although cheaply mined, Cornwall ore, except as to phosphorus contents, compares unfavorably with many ores in use. Its component of sulphur demands roasting, which adds about 20 cents per ton to the cost, and unless the ore is well selected 2 tons will hardly suffice to produce 1 ton of pig iron. (The 13 blast furnaces in the Lebanon district have over 120 Ggers and Davis-Colby roasting kilns. Anthracite coal is used as fuel, being fed with the ore, but furnace gases and gas made in producers from coal and from oil have also been employed to a limited extent.) The sulphur remaining in the ore, and the varying proportion of silica, demand a charge of limestone of from 25 to 40 per cent. of the ore burden when using average fuel, and fuel sufficient to treat from 2.5 to 2.9 of stock must be supplied. The roasting of the ore and handling of stock add to the labor per ton of pig iron, and the metal when produced, although within the Bessemer limit as to phosphorus, is open to criticism on account of the high silicon, the copper it contains, and in some grades the sulphur is excessive.

Notwithstanding these drawbacks the Cornwall ore banks must continue to exert a very decided influence in maintaining the position of Eastern Pennsylvania as an iron producing district. The ore being of the Bessemer grade brings it into demand, and the low price at which it can be mined permits of producing pig iron at low cost notwithstanding the excess of fuel and labor which has heretofore been demanded. The inactivity of so many of the blast furnaces close to the ore hills will naturally be considered as an indication that the Lebanon district is not advantageously located for iron production. But this may be accounted for in part, because the ore being of Bessemer grade there has been a somewhat restricted market for pig iron for making Bessemer steel, although considerable mill and foundry iron has been and is now produced from a mixture of mill cinder and Cornwall ore, and Cornwall pig is used in open hearth steel furnaces. Another reason is that some of the idle furnaces are owned by parties who seem to prefer to draw revenue from the sale of ore to others rather than to use ore in excess of the quota represented by their interest in the Cornwall Ore Hills Company. Most of such owners, being wealthy, can readily elect the source of income which is most attractive. A third reason is that, following too closely long established methods and practice, the output of most of the blast furnaces has not reached what can be obtained, and the outlay for labor is excessive. The necessity of roasting iron ore (which is done at the furnaces) adds to the cost of labor there, but even if this is charged up to the ore, the

other labor items are greater than prevail at some furnaces handling the same amounts of material. Being controlled by persons of ample wealth, few of the furnaces in the Lebanon district have been confronted by the conditions which have done so much to cheapen production elsewhere. The apparent opportunities for advancement in the district seem to be in increasing the output per furnace and in reducing labor and fuel per ton, and one method of accomplishing this is in improving the average quality of ore used.

Although the output of the Cornhill hills may be considered as being all of Bessemer grade, it varies greatly in the amount of iron carried, the quantity of silica, lime, alumina and magnesia, and also in the percentage of sulphur, phosphorus and copper. A complete analysis of lean ore made by A. S. McCreath shows in addition to the varied contents named some manganese and cobalt, and is as follows:

Bisulphide of iron.....	3.431
Peroxide of iron.....	51.852
Sesquioxide of iron.....	0.371
Protoxide of manganese.....	0.490
Oxide of cobalt.....	1.472
Sulphide of copper.....	2.969
Alumina.....	9.510
Lime.....	7.917
Magnesia.....	0.534
Sulphuric acid.....	0.038
Phosphoric acid.....	None
Carbonic acid.....	1.120
Water.....	19.750
Alkalies, &c., undetermined.....	
Silica.....	99.454

Equivalent to

Metallic iron.....	39.600
Metallic manganese.....	0.288
Metallic copper.....	0.507
Sulphur.....	2.557
Phosphorus.....	0.017
Phosphorus in 100 parts iron.....	0.042

The necessity of careful sorting is evidenced by an inspection of a lot of Cornwall ore, and although the variability of color from a pale green gangue carrying from 5 to 10 per cent. of iron to a dense black ore yielding 55 to 65 per cent. of iron, and the sheen of pyrite crystals or discoloration due to copper, give a general idea of the contents of the ore, such visible indications are far from infallible. Improved blast furnace practice permits of eliminating most of the sulphur remaining in the ore after roasting, and the rolling mills have overcome many of the difficulties which are credited to copper, of which from 0.4 to 0.8 per cent. is found in Cornwall pig; but any apparent drawback due to this is offset by the low phosphorus, which ranges from 0.04 to 0.06 per cent., leaving the principal objection to Cornwall Bessemer pig as now produced in the silicon ranging from 2 to 4 per cent.

Nowhere else in the eastern portion of the United States can pig iron as low in phosphorus as that produced in the Lebanon Valley from Cornwall ore be made in large quantities at a rate consistent with present quotations. To make low phosphorus pig in the Pittsburgh district selected high priced ores are necessary, and the same holds true of the seaboard. The Cuban ores which have been liberally imported produce a pig iron just inside the requirements of the Bessemer process, and the proprietary interest which two steel companies have in these deposits have undoubtedly influenced the substitution of this foreign ore for that won from the Cornwall hills.

Prof. A. S. McCreath made seven analyses of the various selling grades of ores, from the light greenish variety

to the black, rich "nigger head" ore, and these showed:

	Per cent.
Metallic iron, from.....	41.9 to 64.9
Metallic manganese, from.....	0.057 to 0.238
Metallic copper, from.....	0.005 to 0.599
Alumina, from.....	0.324 to 7.815
Lime, from.....	1.010 to 4.330
Magnesia, from.....	1.131 to 7.459
Sulphur, from.....	0.050 to 3.271
Phosphorus, from.....	0.007 to 0.023
Silica, from.....	3.980 to 20.91

A portion of the gangue is very refractory and is fused with difficulty. In a deposit of the magnitude of the Cornwall ore hills it is to be expected that ore of varying qualities will be obtained and changes in character may be recognized as the explorations are carried further from the surface.

OBITUARY.

DOUGLAS BAIRD.

Douglas Baird, superintendent of the Old Dominion Iron & Nail Works on Belle Isle, died recently of peritonitis. Mr. Baird was born in Glasgow, Scotland, May 22, 1815, and when three years of age was brought to Virginia by his father, James Baird, a mining engineer, who came here to take charge of the old Midlothian pits, and who built the road from the pits to Rocketts. In his early youth Mr. Baird worked with his brother, Robert, who was a millwright and a founder and owned Baird's foundry in Manchester. When 22 years old he became connected with the Old Dominion Iron & Nail Works and with the exception of an interval of some 18 months, late in the forties, remained with that plant until his death.

GEORGE F. SIMONDS.

Reports received at Fitchburg, Mass., announce that George F. Simonds was killed in a railroad accident at Scranton, Kan. Mr. Simonds, who was born in Fitchburg in 1842, was connected for a considerable period with the saw manufacturing plant at that place. Later he became interested in the rolling machine with the development of which his name is so closely coupled. Works were built at Fitchburg, Mr. Simonds believing that his method would be available for such large articles as railroad axles. It was at an early stage, however, that the manufacture of balls for bearings attracted attention, and it was to the elaboration of ball bearings for vehicles, &c., that Mr. Simonds devoted a large share of the past few years. In the course of this work he became interested in hardening and tempering steel and spoke enthusiastically of his achievements in that direction, without, however, permitting any publicity as to results or revealing his methods.

The Dominion Government has closed a contract for rails to be used on the Government railroads. The Cockerill works of Belgium have secured the contract, which is for 4300 tons to be delivered at Halifax before June, 1895. It is understood that the price for the rails is about £4 per ton. About 3000 tons of the supply will be used on the main line of the Intercolonial Railroad, 1000 tons on the Prince Edward Island branch and the balance, 300 tons, on the Windsor branch.

MANUFACTURING.

Iron and Steel.

The King, Gilbert & Warner Company, Columbus, Ohio, operating the Middleport Steel & Nail Works, at Middleport, Ohio, have decided to remove that plant to Columbus, where a complete modern plant will be erected. As contemplated at this time, the new plant will consist of a converter house, 85 x 100 feet, with two converters; a cupola house, 54 x 33 feet, with three 8-foot cupolas; a blooming mill, 161 x 85 feet; an engine, pump and dynamo house, 50 x 70 feet; a refractory and crushing house, 40 x 100 feet; a boiler house, 45 x 150 feet, with 20 boilers; a gas producer house, 35 x 65 feet, with five gas producers. In addition to these the company will erect a rolling mill 100 x 110 feet. Five of the buildings are to be of iron, and the others of brick and iron combined.

Last week a strike of the rail straighteners employed at the Edgar Thomson Steel Works, Bessemer, Pa., took place. The men did not go on strike on account of reduction in wages, but because additional work was required of them, which they refused to perform. The places of the strikers, 24 in all, have been filled with new men.

At a recent meeting of the stockholders of the Norton Iron Works, Ashland, Ky., a committee of three was appointed to lease or rent the plant of that concern, which has been idle for some time.

The Reading Iron Company, Reading, Pa., will erect an additional rolling mill plant for the manufacture of grooved skelp iron. The site selected is immediately adjoining the Keystone blast furnaces of this concern. Portions of the work are already under way, although the plans are not as yet completed in all details. It will be a complete mill of modern type in all respects. All the machinery required will be constructed in the Scott Foundry Department of the Reading Iron Company.

At the annual meeting of the stockholders of Cofrode & Saylor, Incorporated, Pottstown, Pa., held last week, Francis H. Saylor, Joseph H. Cofrode and Henry R. Leonard were elected directors.

It is stated that a company of Pittsburgh capitalists have about closed a deal for the purchase of a site in New Kensington, Pa., on which a tin plate plant will be erected. It is stated this new plant will be about one-half the size of the one now under erection by Goldsmith, Lowenberg & Co. of that place.

The plant of the Brilliant Steel & Iron Company, Brilliant, Ohio, which has been idle for some time, has been purchased by Joseph R. Jackson, formerly superintendent of the plant of the National Tube Works Company, McKeesport, Pa. It is stated that others are interested with Mr. Jackson in the purchase. It is the intention to make a number of improvements to the plant, and it will be equipped for the manufacture of wrought iron and steel pipe.

The plant of the Lima Steel Casting Company, Lima, Ohio, which has recently been rebuilt has been put in operation, giving employment to 60 men.

At Pittsburgh last week argument in the equity proceedings of Jas. Todd and Frank Slocum against the Sterling Steel Company of that city was heard. It is an action to recover large royalties on steel projectiles manufactured for the United States Government under a contract the plaintiffs made with the defendant company for a royalty of 1 cent on every pound manufactured. James Todd claims to be the inventor of the process of making aluminum chromium steel.

In consequence of the refusal of the creditors of the Moorhead-McCleane Company of Pittsburgh to grant that concern more concessions, a note for \$150,000 given to the creditors and indorsed by M. K. Moorhead has been allowed to go to protest. The principal indebtedness of this concern is held by banks in Pittsburgh and at this time it is not known what action will be taken in the matter.

Preliminary work on the erection of four blast furnaces at Duquesne, Pa., to supply pig metal to the Duquesne Steel Works, mention of which was made in these columns last week, has been commenced. The four furnaces are expected to have a capacity for turning out from 1200 to 1600 tons of pig iron per day.

At the annual meeting of the stockholders of the Reading Rolling Mill Company,

lessee, Reading, Pa., held in Philadelphia last week, the following directors were elected: Joseph H. Cofrode, Francis H. Saylor, Charles A. Sterling, George W. Bush, Edward J. Kelly, Ellis Ames Bolland and L. P. Evans.

It is stated that an effort is being made to reorganize the Kellogg Seamless Tube Company, at Findlay, Ohio, with the object of putting the plant in operation. The project includes buying up the indebtedness of the concern at 50 cents on the dollar and the formation of a new company to be known as the Kellogg Weldless Tube Company. It is claimed that a majority of the creditors have assigned their claims to the International Trust Company of Boston, Mass., under an agreement with John C. Polley of Boston, who is carrying through the work of reorganization.

An error was made in the last issue in locating a new rolling mill at Lake View, Wis. It is being built at Lake View, Washington, near Tacoma, the machinery having been removed thither from Burlington, Iowa. The works are expected to be ready for operation about March 1, 1895.

As already noted in these columns, the Beaver Tin Plate Company have been organized at New Lisbon, Ohio, and are now engaged in the erection of a tin plate plant at that place. The main or mill building will be 200 x 100 feet in size and will be of iron. The tin house will be 60 x 184 feet, and will be built of brick; the annealing house will be 70 x 80 feet and will be built of iron, while the boiler house will be 45 x 60 feet, and will also be of iron. The boiler house will have a capacity of 600 horsepower. The foundations are now being put down for a six-mill train of hot rolls, though only four will be put in at present. The foundations for the cold rolls of four mills have already been completed. The engine to drive the hot mills will be 32 x 60 inches and for driving the cold mills 26 x 48 inches, and both will be of the Corliss type. Electrical cranes will be installed, one of 12 tons capacity in the main building and one of 5 tons capacity in the annealing and tin house. The entire plant will be equipped with the most modern and labor saving machinery of the highest class. The work of construction is being pushed as rapidly as possible, and the new concern expect to be in the market early in the coming year. Charles W. Bray, formerly secretary of the Lloyd Booth Company, Youngstown, Ohio, is president of the Beaver Tin Plate Company.

The programme of operations at the Homestead Steel Works, Homestead, Pa., posted in the plant last week, is as follows: The 32-inch and 119-inch mills will run on single turn, the 10, 23, 28 and both open hearth departments will run on double turn, while the 33, 35, 40 inch mills and the converting mill will be idle.

The four furnaces of the Pennsylvania Steel Company, Steelton, Pa., made quite a record for production last month. Furnace No. 3 made an average of over 200 tons per day during the month, using Cuban ore. Furnaces 3 and 4 combined made a product of over 12,000 tons of iron for the month. No. 1 furnace is using Lake ore and averages over 100 tons per day.

The South Mills of the Lackawanna Steel & Iron Company, Scranton, started in recently on orders aggregating 6000 tons of rails, which will be rolled in about two weeks.

J. Jones Hudson has applied for a charter under the name of Crum-Lynne Iron & Steel Company, works at Crumm-Lynne, near Chester, Pa. The mill is expected to start work next week on skelp iron, for which they have good sized orders on hand.

The Woodstock Iron Company of Anniston, Ala., are to be reorganized under the name of the Woodstock Iron Works. The company own two coke furnaces and one charcoal stack, built and blown in during 1889.

In answer to the report that the Chartiers Iron & Steel Company, Limited, of Pittsburgh, manufacturers of fine sheet iron and sheet steel, and whose works are located at Carnegie, Allegheny County, Pa., would erect a tin plate plant in the near future, we are officially advised that the statement is untrue. It is suggested that the report was gotten up for the purpose of booming some of the street car lines which are now under way in the direction of Carnegie.

Machinery.

The plant of the New York Locomotive & Machine Works, at Rome, N. Y., which was destroyed by fire last December, has

been entirely rebuilt, and the company are preparing to do business on a larger scale than ever before.

The Stow Mfg. Company of Binghamton, N. Y., manufacturers of the Stow flexible shaft, have good reason to be hopeful for future business, since their business for the past three months shows an increase of 33½ per cent. over the corresponding months of 1893.

The Northwestern Steam Boiler Works are building a plant at Duluth, Minn., for the manufacture of stationary, marine and locomotive boilers.

The Bickford Drill & Tool Company of Cincinnati, Ohio, have just shipped one of their largest radial drills to England, and also have on their books orders for four to go to South Africa.

The molders and helpers, constituting 300 of the 900 employees, of the pipe works of the Henry McShane Mfg. Company of Baltimore, Md., have gone on strike against a reduction of wages. The company refer to the reduction as being 10 per cent., while it is claimed by the employees that it ranges from 10 to 67 per cent. The company claim that the reduction is made necessary by the competition of prison made goods in some of the lines of their manufacture.

The Oakland Iron Works, at Oakland, Cal., have been injured by fire, the loss being estimated at \$22,000; insured for \$10,900.

The Louis Schwartz Machinery Supply Company of New Orleans, La., have failed. The company claim to be solvent and the business will probably continue without interruption. The company had carried on a successful business for 25 years.

The machine shop of the Central Tennessee College, at Nashville, Tenn., has been destroyed by fire, believed to have been of incendiary origin. The loss is placed at \$20,000 on machinery and \$4000 on building.

The Hendey Machine Company, manufacturers of machinists' tools, at Torrington, Conn., report an increase in business during the past two months. Their export trade has continued good throughout the year and their home trade is also very satisfactory.

The Weimer Machine Works Company of Lebanon, Pa., have booked the following orders for their liquid cinder cars: Four 160 cubic feet capacity cars for the Illinois Steel Company, South Chicago, Ill.; three 110 cubic feet capacity cars for the Poughkeepsie Iron Company, Poughkeepsie, N. Y., and one of the same capacity for the Sloss Iron & Steel Company, Birmingham, Ala. They report a number of orders for their patent furnace filling barrows.

The Ferracute Machine Company of Bridgeton, N. J., manufacturers of presses, dies and other sheet metal tools, have recently received orders for three special inclined embossing presses for the Standard Caster & Wheel Company of New York, and have furnished previously to that company 12 of their other presses for the manufacture of patent ball joint casters. Among recent shipments were six presses with automatic dial feed attachment and embodying entire new features for accurate feeding to the Metal Rim Rag Company of New York, and a press for the General Electric Company of Schenectady, N. Y., which weighed about 20,000 pounds, and is capable of cutting out a blank 54 x 36 inches and will give a pressure of nearly 100 tons. They are also building two more presses of the same general style for sheet metal work in Western factories.

The Lima Locomotive & Machine Company, Lima, Ohio, manufacturers of freight cars and railroad equipment, purchased the plant of the Lima Steel Casting Company some months ago. The plant has been thoroughly overhauled and rebuilt and was put in operation about the first of this month. The plant is equipped with a 10-ton open hearth furnace and sufficient men are employed to work this furnace to its full capacity. The plant is so arranged that additional furnaces can be erected at any time, if necessary.

Hardware.

Arcade File Works, Anderson, Ind., have just let the contract for an addition to their already large plant. The building will be brick throughout and will be entirely fire proof. It will be 95 feet long and 30 feet wide. The addition will be used for forging and stripping departments.

Penn Hardware Company, Reading, Pa., have added a new department to their business. They are now engaged in preparations for the manufacture of iron, brass and bronze metal, flat and round head wood screws and lock and side knob screws.

The employees of the United States Whip Company, at Westfield, Mass., have been notified that their wages will be reduced 10 per cent.

The W. H. Avis Cordage Mfg. Company, Toronto, Ont., will put a branch factory in operation at Buffalo, N. Y., that will give employment to 100 operatives.

An item going the rounds of the trade press during the past few weeks conveys the impression that the Anthony Wayne Mfg. Company of Fort Wayne, Ind., in view of the plant being erected for them at St. Louis, Mo., would give up the former location. Recent advices from the company are to the effect that a branch factory has been established at St. Louis 50 x 125 feet, four stories, located on the corner of Main and Sidney streets, which is now being equipped with the necessary machinery to turn out at least 300 machines a day. This step has been taken in order to be right in the center of the market, saving freights on lumber, also shipping machines from Fort Wayne, the St. Louis trade on the company's production averaging from 25,000 to 30,000 machines annually, which amount, it is believed, can be doubled as soon as the new plant is in complete operation. The Fort Wayne plant will be operated as heretofore under the able supervision of A. C. F. Wichman.

Miscellaneous.

The Western Mfg. Company of Swissvale, Pa., have been granted a charter of incorporation, with a capital stock of \$25,000. The directors are: Andrew Hopkins, John R. Cavanaugh, P. B. Buirne, B. J. Devlin and Jos. Hawley, all of Pittsburgh. The plant of this concern has already been put in operation and the manufactures consist of several household articles, the concern giving employment to about 40 men.

The Pittsburgh Reduction Company, manufacturers of pure aluminum, with works at New Kensington, Pa., and Niagara Falls, N. Y., will put in a new roll train in their plant at New Kensington, the contract having been given to the A. Garrison Foundry Company of Pittsburgh. There will also be an addition to the rolling mill buildings to cover this proposed extension. The Pittsburgh Reduction Company are manufacturers of aluminum in the form of ingots, bars, wire, tubes, sheet and castings. It is not the intention of this concern to manufacture aluminum articles in the form of either stamped or finished goods of any kind. It is stated that this concern manufacture about 98 per cent. of all the aluminum made in this country, the other 2 per cent. being imported.

The Bettendorf Metal Wheel Company, at Davenport, Iowa, will rebuild the works on a much larger scale which were burned on the night of the 30th ult. The City Council have agreed to vacate a short street adjoining the property, which will enable the company to greatly extend their plant in a direction which has long been contemplated. A new iron and steel structure will be built, which is expected to be so much larger than the old works that at least 50 per cent. more men can be employed. It is the intention of the company to make these works rank among the most important in the great manufacturing locality in which they are situated.

The Champion Iron Company of Kenton, Ohio, report the largest business in October that was ever done by them in one month. Their sales aggregated \$50,000, \$10,000 over any month previous. They manufacture iron fences, railings, stairways, general architectural work, jail fixtures, &c.

The dispute between the H. C. Frick Coke Company and W. J. Rainey, coke operator, over the division of the Beeson coal tract, at Mt. Braddock, was on trial last week before the master, R. F. Hopwood, who was appointed by the courts to take testimony in the matter. Some time ago the H. C. Frick Coke Company purchased two-thirds of the tract and W. J. Rainey the other one-third. They are unable to agree as to the division of the tract. Both sides offered considerable testimony.

The National Sanitary Furnace Company of Philadelphia have been chartered under

the laws of Pennsylvania, for the purpose of manufacturing machines, furnaces and devices for destroying waste material, garbage and refuse matter, and for the purpose of manufacturing fertilizers from the same. The company are capitalized at \$50,000.

The Gemlo Iron Company of Minneapolis, Minn., are manufacturing a new shovel and crane, for use on dredging boats, invented by F. O. Kilgore, a resident of that city. The machines thus far turned out have given satisfaction, and are, it is stated, a decided departure from the ordinary form of dredges. Ultimately a plant for their sole manufacture will be established at Minneapolis.

The Stewart Iron Works of Wichita, Kan., announce in a circular to the trade that owing to their increased business throughout the West and Southwest, and believing that they can better serve their customers by being closer to the base of supplies, they will remove their entire plant from Wichita to Cincinnati, Ohio, on December 1. They will occupy a large new four-story structure at 242 and 244 Sycamore street, where they will possess increased facilities for the manufacture of iron fence, iron and steel jails and architectural iron work.

The new machine shop for the American Hard Fibre Company, at Newark, Del., is now completed. It is designed and built by the Berlin Iron Bridge Company of East Berlin, Conn., and is 50 feet wide by 226 feet long, the roof being made of steel and covered with the Berlin Iron Bridge Company's patent anti-condensation corrugated iron roof covering.

Fred. B. Farnsworth has been appointed permanent receiver for the Frisbie Elevator & Mfg. Company of New Haven, Conn., who failed recently. It is intended to reorganize the company and continue the business. The assets and liabilities of the company are said to be about equal.

At a recent meeting of the stockholders of the Buchanan Bridge Company of Bellefontaine, Ohio, it was decided to change the name of said company to the Bellefontaine Bridge & Iron Company. Having added the departments of structural and ornamental iron work and jail work, in addition to the building of wrought iron and steel bridges, it was deemed expedient to change the name of the concern to one that would more closely indicate the classes of work turned out. The Bellefontaine Bridge & Iron Company have recently completed the iron work for the Pike County Court House, at Pittsfield, Ill. The officers of the Bellefontaine Bridge & Iron Company, who are manufacturers of structural and ornamental iron work, iron and steel jail work, wrought iron and steel bridges, are as follows: W. W. Fisher, president; P. E. Cory, secretary and treasurer, and F. O. Hanson, superintendent.

On November 5 the last span of the bridge across the Ohio River, connecting Louisville, Ky., and Jeffersonville, Ind., was finished. The span was 550 feet in length, being one of three of the same length. One of the other spans is 210 feet, and the other two 340 feet, making six spans in all. The approach on the Indiana side is 4000 feet long. All of this is completed. The approach on the Kentucky side is to be 2600 feet long. The height from low water to the coping of the bridge is 90 feet. The trusses are 84 feet high by 80 feet wide, single track, with footway on each side. The entire bridge, including approaches, is of steel. The traveler, which handles the heavy material, is 105 feet high. The last span was completed entirely in 54 hours' time. The sub-structure will all be removed by the 15th of the present month, and the bridge proper completed will be turned over to the owners by the Phoenix Iron Company, who built it. This bridge will be operated by a company, and several railroads are now figuring for the right to use it. The two most prominent projectors of this bridge, Dennis Long and Jacob Krieger of Louisville, both died before the bridge was more than started.

The Iron and Metal Trades.

Those who entertained somewhat sanguine views as to the immediate effect of the result of the elections upon business have been disappointed. Buyers have not jumped into the market, and the volume of business has shown practically no increase. We have no doubt but what the removal of a possible source of danger has strengthened confidence. The feeling is better, but there are other considerations which outweigh that in shaping the near future of the Iron trade.

We are now on the threshold of winter, which is usually dull in the Iron business, unless buyers think it wise to anticipate their spring requirements. It was not so many years ago that the Rail mills had on their books, as early as October 1, orders for 1,000,000 tons of Steel Rails, for delivery during the succeeding year. Until now the position is very different. Few rolling mills, foundries, car shops or builders have orders reaching much beyond the current year and the majority have gaps to fill for 1894. Buyers cannot be tempted. We know of instances in which very advantageous terms were offered, without leading to the slightest anticipation of requirements.

The modest demand for Finished Material is making the Steel works more indifferent buyers of Bessemer Pig, and that has created a weakening tendency. Thus far, as we have explained, the balance has been well poised. But let the two large Rail mills in the West, each making about 8000 tons of Rails per week, shut down for lack of orders and then there is at once an outlet closed for nearly 18,000 tons of Bessemer Pig per week.

Mr. Carnegie's emphatic remarks about the inexpediency of combinations, at the Richards dinner last week, have caused much speculation as to the future of the Steel Rail Association, and there are rumors that at least one mill is taking time by the forelock.

In the Wire trade the latest development is the rupture of the newly formed Barb Wire combination, while war goes on vigorously in the Wire Nail trade. In the Cut Nail trade gossip deals most with a sale of 5000 kegs to a cooperage company closely allied with the Sugar Trust.

The starting of two of the leading Western Tin Plate mills on a non-union basis is a movement of much significance. It means that an effort is being made to drive the Amalgamated Association out of one of its last strongholds.

Birmingham advices indicate that the Japanese Cast Iron Pipe order is not definitely closed.

Chicago.

(By Telegraph.)

Office of The Iron Age, 59 Dearborn street, CHICAGO, November 14, 1894.

A very much better feeling is perceptible in every direction. The most pleasant feeling following the election is the complete obliteration of calamity prophets. The prospects are now altogether hopeful. No disturbing elements whatever are in sight. The gradual betterment during the year is expected to be accelerated, now that the tariff and currency questions are believed to be settled for a considerable time to come and doubtful experiments are not coming up to be tried. It is the wrong time of the year to expect immediate improvement in the volume of business, but almost without exception a large trade is looked for at the end of the year. Still, in some lines a noticeable increase in the demand has already appeared and there are certain branches of finished products in which much larger sales could be made if manufacturers were in a position to ship promptly.

Pig Iron.—The past has been a very fair week in local Coke Iron and several important deals were closed. While the lateness of the season would appear to be unfavorable to heavy business, there are good prospects of the demand continuing moderately active until the spring trade sets in. The most hopeful feeling prevails among both manufacturers and consumers. Prices of local Coke Iron, however, are not expected to advance for some little time, until general conditions show more improvement. Our quotations on local Coke Iron have been revised this week in order to bring them more closely in harmony with actual prices recently current. This is not to be taken as indicating that values have receded during the week, but is done in order to make a better basis on which to show any advance which may be made toward a higher range of values. Southern furnace agents have done very little in this vicinity of late except in a few instances in which cut prices have been made by some companies evidently in need of orders. Soft grades are a trifle firmer. Lake Superior Charcoal is in somewhat better demand, which is perhaps owing to the fact that the large dealers are again giving some attention to this class of Iron, which they have long neglected. Quotations are given as follows for cash:

Lake Superior Charcoal....	\$13.00	@	\$15.00
Local Coke Foundry, No. 1.	10.12½	@	10.25
Local Coke Foundry, No. 2.	9.50	@	9.75
Local Coke Foundry, No. 3.	9.25	@	9.50
Local Scotch.....	10.25	@	11.00
Ohio Strong Softeners No. 1	13.00	@	13.50
Southern Silvery, No. 1.....	11.50	@	11.75
Southern Silvery, No. 2.....	11.25	@	11.50
Southern Coke, No. 2.....	10.25	@	10.50
Southern Coke, No. 3.....	9.75	@	10.25
Southern, No. 1, Soft.....	10.25	@	10.50
Southern, No. 2, Soft.....	10.00	@	10.25
Alabama Car Wheel.....	17.50	@	18.00
Jackson County Silvery....	15.50	@	16.00
Other Ohio Silvery....	14.25	@	14.50
Coke Bessemer.....	11.01	@	11.25
Coke Malleable.....	11.00	@	11.25
Spiegeleisen 20%.....	...	@	26.00

Bars.—A slightly improved inquiry is noted and a much better tone is perceptible throughout the trade. It is asserted that the very low prices recently made are now less easy to obtain by buyers. Quotations, however, are unchanged on Common Iron at 1.02½¢ @ 1.05¢, Chicago, on mill shipments. Guaranteed Iron continues to be quoted at 1.15¢ @ 1.20¢. Soft Steel Bars from strictly Billet stock are a little firmer and may now be quoted at 1.25¢. Jobbers quote small lots at 1.15¢ upward for Iron, and 1.30¢ up-

ward for Soft Steel. They report a considerably better trade and good inquiries from the larger consumers, indicating that they are now disposed to take in stock.

Structural Material.—The largest contract recently placed in this field is one for a building in Dubuque, which will require about 300 tons of Beams. It was secured by a Chicago contractor. A fair demand exists for small lots of Building Shapes and Bridge Material. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Angles, 1.40¢ @ 1.45¢; Tees, 1.65¢; Universal Plates, 1.40¢ @ 1.45¢. Small lots of Beams and Channels from stock, 1.50¢ @ 1.55¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

Plates.—Dealers report plenty of business offering. The progress this month is in the direction of still larger trade, keeping up the record of the year, which has shown a gradual increase from month to month. This increase has taken place in dollars and cents, which shows a heavy gain in tonnage over the business of last year. Some complaint is made that freight rates are being cut on shipments to parts of the West. We continue prices on mill shipments, Chicago delivery, as follows: Tank Steel, 1.40¢ @ 1.50¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.70¢ @ 1.80¢; Tank Steel, 1.50¢ @ 1.65¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 75 % off.

Sheets.—Good specifications for Black Sheets are in the market, but competition is now keen, as the mills at this time of the year find their order books only slightly filled and are vigorously seeking business. Mill shipments of No. 27 Common Iron for early delivery are quoted at 2.30¢ @ 2.35¢, Chicago; Steel Sheets, 2.40¢ @ 2.45¢. Galvanized Sheets are not in any better condition than reported last week. Business is still light and mill shipments are now quotable at 80 % off. Sheet Copper continues at 14¢ base. Small lots of No. 27 Common Sheets from stock are still quoted at 2.40¢ @ 2.50¢, and Galvanized Sheets 75 and 10 % off.

Merchant Steel.—A marked increase in inquiry is noted by manufacturers of standard Steel Shapes as well as makers of Specialties. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.75¢ @ 1.80¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

Billets and Rods.—A very good demand has sprung up for Billets and Tin Plate Bars, with inquiries extending to the middle of 1895. The improvement in this trade is a strong indication of the belief among manufacturer consumers that business will be much better during the coming year. A heavy increase has also taken place in the demand for small lots for prompt delivery. The local makers quote \$17 on ordinary Billets, but are careful not to make these quotations apply to long deliveries running into next year. The demand for Rods in this locality seems to be in excess of supply. The mills are full of work for the balance of the year, but are still receiving inquiries from consumers.

Rails and Track Supplies.—Small orders only are now being received by the local mills, as the end of the track

laying season is at hand. Some interest is being taken in contracts for the coming season, and it is reported that a considerable tonnage is already in sight, but prices have not yet been fixed, and negotiations thus far have been indefinite. Quotations are continued as follows: Standard Rails, \$25 @ \$27; Steel Splice Bars, 1.30¢ @ 1.35¢; Track Bolts, with Hexagon Nuts, 1.90¢ @ 2¢; Spikes, 1.70¢ @ 1.75¢; Links and Pins, 1.65¢ @ 1.75¢.

Old Rails and Car Wheels.—A number of transactions have lately been made in Old Iron Rails at prices ranging from \$10.75 to \$11.25, according to quantity and terms of sale. The largest lot sold was 1700 tons. A fair demand is reported for short pieces of Old Steel Rails, which are now bringing from \$7.50 to \$8.25. Old Car Wheels are quiet and lower, quotations now ranging from \$9 to \$9.50.

Scrap.—Trade has been dull in this class of material. Inquiries are in the market, but sales appear to be light. Prices are firm. Winter seems to have opened throughout the Northwest and the heavy fall of snow this early in the season is expected to have some influence on the quantity of Scrap brought into the market. Dealers quote the following selling prices per net ton: Railroad Forge, \$9; Dealers' Forge, \$8.50; No. 1 Mill, \$7; Pipes and Flues, \$7; Axles, \$13; Heavy Cast, \$7.50 @ \$7.75; Stove Plates, \$5.50 @ \$6; Cast Borings, \$3.50; Wrought Turnings, \$5.50; Axle Turnings, \$6.25; Fish Plates, \$9.50 @ \$10; Horseshoes, \$9.25; Mixed Steel, gross ton, \$6; Heavy Melting Steel Scrap, \$7 @ \$7.50.

Metals.—Lake Copper is very quiet but unchanged at 10¢ for carload lots. Casting Copper is weaker and 9.50¢ is now the maximum price. Spelter is lower and carload lots are being quoted at 3.20¢ @ 3.25¢. Pig Lead is quiet but firm at 2.97¢.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., November 13, 1894.

The elections have resulted in entire accordance with the wishes of the Iron and Steel trade, so that on that score there is nothing more to be desired. It may perhaps be a little premature to say what the immediate effect will be, but in regard to the ultimate outcome, it is expected to be entirely beneficent, not only on Iron, but on all other manufacturing interests. Immediately after the results were known, inquiries for quotations became numerous, and options that were out at the low figures of the week previous were promptly taken up, but beyond that there is no distinct change in the situation. Sellers were found willing to meet the market at the old prices, so that for the time being the indications do not point to anything more than a continuance of the conditions recently ruling, plus a feeling that there is much to be hoped for and nothing to be feared in the way of legislation. A careful consideration of the entire field ought therefore to be satisfactory, as the gain in the moral effect is very distinct, with nothing whatever that can be construed as less favorable than before. It is just as well perhaps that prices have remained stationary, as a vast amount of preliminary work must be done before any upward movement can be permanently sustained, in view of which sellers are still quoting October prices for material of every description.

Pig Iron.—A few enthusiasts undertook to quote higher prices on Wednesday, but finding that orders were filled elsewhere, they soon reconsidered their action, and dropped back to the old figures, at which there is a good healthy demand. There is no particular reason for prices being higher except that they are too low for a reasonable margin of profit, but so long as there is a supply fully equal to the demand there is no reason why consumers should pay more money, as their margin is also much less than it ought to be. The next movement, when it comes, may perhaps be in sellers' favor, but as a good deal of Iron is being sold at current prices for 1895 delivery, it is hardly likely that there will be much, if any, change during 1894. The output of 8,000,000 tons per annum in round numbers is a wonderful change from less than 4,250,000 a year ago, and to sustain prices on a more than 90% increase since that time is an achievement almost without parallel, considering that the demand during that period has been of an ordinary character. Prices have offered no special inducement, yet things have been so adjusted that production has increased month by month, until we are pretty nearly back to the 1891 and 1892 figures, all the while decreasing stocks on hand. It would be unreasonable, therefore, to expect any upward movement in prices until the demand leads the supply, but it is surprising how closely the demand has followed the supply. If it had not done so, stocks would show an increase, and prices, low as they are, would have reached a point still lower than the very lowest that have yet been recorded. There is a little weakness in Bessemer Iron; other descriptions are steady at prices as last quoted for Philadelphia and equivalent points.

Bessemer.....	\$12.75	@	\$13.00
Standard No. 1 Foundry X.....	12.50	@	12.75
Standard No. 2 Foundry X.....	11.50	@	11.75
No. 2 Plain.....	10.75	@	11.00
No. 1 Soft.....	11.50	@	11.75
No. 2 Soft.....	10.75	@	11.00
Standard Gray Forge.....	10.50	@	10.75
Ordinary.....		@	10.25

Muck Bars.—There is a little more inquiry, and one lot of extra quality were taken at \$19 f.o.b. cars seller's mill, but ordinarily they can be done at \$18.25 @ \$18.50.

Billets.—A large business has been done in Billets at prices ranging from \$17.80 to \$18, delivered in Philadelphia or at points with equivalent rates of freight from Pittsburgh and Wheeling. The feeling is a little feverish, and sellers are trying to quote better prices, but the most desirable orders have been secured at prices named, and the demand is not now of a first-class character. In the absence of large orders \$18 @ \$18.25 may be the ruling prices nominally, but prompt bids from the right parties and for right deliveries would stand a good chance of being accepted at the inside figure above quoted.

Finished Material.—There is less change in this department than might have been expected, and while manufacturers are hopeful there is some disappointment at the outcome of the past week's business. In spots a few nice orders have been secured, and the general movement is somewhat larger than it has been, especially in Skelp and material of that character. Some wide awake concerns have picked up a good deal of business at points usually regarded as beyond the reach of Eastern mills, so that without any particular increase in the demand from local consumers, mills have made nice additions

to the work already in hand. Other^s are living in expectation of something better in the near future, but meanwhile buyers have no trouble in getting all the material they want at the inside figures recently quoted, viz.:

Grooved Skelp.....	1.22½¢	@	1.25¢
Standard Refined Bars.....	1.20¢	@	1.25¢
Medium quality.....	1.10¢	@	1.15¢
Tank Steel.....	1.30¢	@	1.35¢
Heavy Plates.....	1.30¢	@	1.40¢
Shell.....	1.50¢	@	1.60¢
Flange.....	1.60¢	@	1.80¢
Angles.....	1.40¢	@	1.50¢
Beams and Channels.....	1.50¢	@	1.60¢

Old Material.—There is a better demand for Old Material, and in some cases a little better prices, but there is no difficulty in securing stock at about the following prices, delivered:

Heavy Melting Steel.....	\$10.00	@	\$11.00
Light Melting Steel.....	8.00	@	8.50
No. 1 Wrought Scrap.....	10.00	@	11.00
Machinery Cast.....	9.00	@	10.00
Wrought Turnings.....	8.00	@	8.50
Cast Borings.....	6.00	@	6.50
Old Iron Rails.....	11.50	@	12.00
Old Car Wheels.....	9.75	@	10.25

William B. Ogden has been appointed the direct sales agent for the Reading Rolling Mill Company for Philadelphia and vicinity, and may be addressed at their Philadelphia office, 257 South Fourth street.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, November 14, 1894.

Pig Iron.—The general condition of the market remains unchanged. Sales are limited to lots of from carloads to 200-ton quantities, while consumers are making bids at lower prices for larger amounts, which, however, the furnaces refuse to entertain. Prices are as low as it is thought they can go, and it is the policy of the furnacemen to stock their Iron rather than shade the market any further. Many consumers are allowing their stocks to run down in view of the annual inventory, so that the market is likely to be quiet until the turn of the year. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$10.75	@	\$11.00
Southern Coke, No. 2 Foundry.....	9.75	@	10.00
Southern Coke, No. 3 Foundry.....	9.50	@	9.75
Southern Car Wheel.....	16.50	@	17.00
Gray Forge.....	9.00	@	9.25
Ohio Softeners.....	14.00	@	14.50

Bar Iron.—At 1.05¢ the market seems fairly settled, and a number of moderate sized lots have been taken at this price. There are a few car orders in shape to be closed very shortly, and mills are likely to feel the influence of this business before long. Jobbers are doing a fair business at 1.15¢ @ 1.20¢ for lots from store.

Barb Wire.—The latest report concerning the proposed agreement among the Barb Wire makers is that the withdrawal of one of the local mills has practically disposed of any agreement, and that the mills will not now be bound by any agreement whatever respecting output. If this is true, and we have reason to believe it is, there is a probability of lower prices prevailing during the balance of the year. We quote Painted \$1.65 @ \$1.75; Galvanized, 40¢ @ hundredweight additional.

Wire Nails.—The Nail business does not show any signs of improvement. A

local jobber has further reduced his price and is now quoting \$1.05 for any quantity, which is as low as some mills are quoting. Other jobbers continue to quote \$1.10 @ \$1.15.

Rails and Track Supplies.—The improvement in the railroad buying noted in our last report continues and the indications point to its continuance. Steel Rails are moderately active, particularly the lighter sections, which are being steadily called for from the Southwest. Track Supplies are quoted as follows: Splice Bars, 1.15¢ @ 1.20; Spikes, 1.60¢ @ 1.65; Bolts, Square Nuts, 1.80¢; with Hexagon Nuts, 1.90¢; Steel Links and Pins, 1.50¢; Iron, 1.60¢; Steel Rails, \$26.50 @ \$27; Old Iron Rails are freely offered at \$11, but no buyers are in the market.

Pig Lead.—An improved tone is noted in this market. Sales are increasing both in number and size, and prices have stiffened somewhat in consequence. At the close to-day sellers were asking 2.95¢ and plenty of bids at 2.92½¢.

Spelter.—The improvement noted in Pig Lead is also being felt in Spelter. The Galvanized Sheet Iron mills are buying more freely and the general demand is improving. At 3.20¢ several carload lots changed hands to-day.

Fulton, Conway & Co. (Incorporated) of Louisville, Ky., were formerly composed of Messrs. Fulton & Conway, but since the death of Mr. Conway, B. P. Grigsby of Bardstown, Ky., purchased the Conway interest. The old firm name was retained. Besides their established place, 827 West Main street, they have recently built an Iron warehouse, 44 x 90 feet, three stories. The lower, or ground floor, which is 19 feet high, is exclusively for Bar Iron and other heavy goods, like shoes, &c. They possess what no other Iron house in this city has—railroad connection, a track running up to the door of the warehouse, doing away with drayage in C. L. lots of goods. This house is the only one in this section of country which deals exclusively in wagon, carriage and blacksmith supplies. They carry no general hardware and shelf goods. This firm operate a wagon wood work factory, making hubs, felloes, spokes and heavy wagon wheels.

Louisville.

LOUISVILLE, KY., November 12, 1894.

Pig Iron.—There seems to be a decided feeling for the better, not that prices have advanced at all, nor that figures named could not be shaded just a little for big round lots, but that the sentiment of wishing has given place to hope and expectancy. The furnaces feel that they will soon control the market and not the buyers. So long as there is a positive demand for some grades, it follows that the other Iron will soon be called for too. No Silver Grays can be had, and a telegram for several cars No. 1 Foundry for immediate shipment elicited reply that none was on hand, although it came from one of the biggest companies in this country. The large consumers will come into the market between now and the first of the New Year, when there will be heavy buying. Prices at present remain the same as last report:

No. 1 Foundry.....	\$10.00
No. 2 Foundry.....	9.25
No. 3 Foundry.....	8.75
Gray Forge.....	8.25
Mottled.....	8.00
No. 2 Soft.....	8.75

The immediate future is not expected to boom up, but next spring a good season of legitimate business will spread over the country. It is certain, however, that low prices in most lines will continue to rule and the trade cannot expect more than an increased volume of business and that will come gradually. Navigation has been resumed in the Ohio River after a cessation of about four months and the cost of getting freight from Pittsburgh has been reduced about 3¢ @ 100 lb.

Wire Nails are still selling freely from mill and dealers' stocks are not accumulating. This cannot be said for Barb Wire, and it is said that very much lower prices must be named to offer any inducement for dealers to stock up heavy. At present writing there are indications that some big mill stocks must be moved, and smaller manufacturers will be shut out, except to local trade. Bar Iron continues in plentiful supply from the mills. Prices from store are \$1.10 @ \$1.15, to good customers. In Boiler and Tank Sheets a good business is doing. Low prices seem to stimulate considerable trade. Pipes and Tubes are in considerable demand and manufacturers contemplate some slight advances in the near future. The Bolt makers will convene on the 14th for a friendly agreement. It is remarkable how some manufacturers can fight and fight, and then meet in friendly confab and agree to fight some more.

Hickman, Williams & Co., Louisville, Ky., have been appointed exclusive sales agents for the Tennessee Coal, Iron & Railway Company's product of their 17 furnaces, for the territory of Louisville, Jeffersonville and New Albany.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, November 13, 1894.

The elections interfered with business in the early part of last week, but commencing with Thursday there was a very fair volume of business. It can be truthfully said that the result of the elections has brought about a better feeling in business circles, and stronger than ever the belief prevails that 1895 will be a good year, as far as volume of business is concerned. November and December are always quiet months in the Iron trade, and it is not expected that this year will be an exception. The situation in the Iron and Steel trades to-day is much the same as it was two or three weeks ago. The volume of business is fair, but orders are for November and December delivery only. Prices show little change, with the exception of Pig Iron, which is lower.

Pig Iron.—The demand is extremely light and prices on Bessemer and Gray Forge are lower. The falling off in the demand for Bessemer Pig during the past two or three weeks is accounted for by the fact that Billets have reached such a low price that Steel mills cannot afford to pay ruling prices for Pig Iron and put it into Steel and realize only \$5 @ ton or less for conversion. Taking the very lowest price at which Bessemer Pig can be bought, say \$10.50 at buyer's mill, with Billets ruling at \$15.50 or less, it only leaves \$5 for conversion, and Steel makers insist that they cannot come out whole at this price. The result of this is that Steel makers, both in Pittsburgh and Wheeling, have withdrawn from the market as buyers of Pig Iron, and are running

their converting capacity only full enough to take care of what Pig Iron they make themselves. There is considerable eagerness on the part of furnace operators to get business and Bessemer Pig can be readily bought to-day at \$10 at Valley furnace, equal to \$10.65, Pittsburgh. Reports are going of a proposed combine among the Valley furnaces, but nothing official has yet been given out. Some inquiries are in the market for Pig Iron for delivery up to July 1, 1895, but outside of one transaction involving deliveries up to April 1 of next year nothing has been done. Furnaces are declining to quote for next year on account of the uncertainty as to what Coke will cost when the present contracts expire. Gray Forge and Foundry Iron are in light demand and prices are weak. We quote as follows:

Neutral Gray Forge.....	\$9.65 @ \$9.75	Cash.
All-Ore Mill.....	9.75 @ 9.85	"
No. 1 Foundry.....	11.65 @ 11.75	"
No. 2 Foundry.....	10.75 @ 11.00	"
Bessemer.....	10.65 @ 10.75	"

We note a sale of 1000 tons of Bessemer at \$10.65, Pittsburgh, and one of 200 tons of Gray Forge at \$9.65, Pittsburgh.

Billets.—Steel for November and December delivery is in fair request, but nothing is doing for delivery next year. With one or two exceptions the mills are firmer in their views as regards prices, and the market as a whole is stronger than it was a week or two ago. An important feature of the situation just now, and one that has added no little strength to prices, is the fact that a leading maker is declining to meet present prices, and is out of the market as a seller. The market continues to be disturbed to some extent by offers of brokers to sell Steel at less prices than the mills will make, and the impression is strengthened that considerable Steel has been sold short, particularly in the East. Billets for November and December delivery may be quoted at \$15.50 @ \$15.75, at maker's mill. Some mills refuse to go below \$15.75, while on the other hand, Steel is being offered by brokers at prices under our lower quotations. We note a sale of 2000 tons of Billets for November and December delivery at \$15.50, at maker's mill, and one of 1000 tons for same delivery at a shade under above prices.

Ferromanganese.—We continue to quote domestic at \$50 @ ton, delivered at buyer's mill. Several lots of foreign have been brought into this market at prices somewhat lower than the above figure.

Plates.—Nothing new developed during the week. Several good orders are in sight, but actual business offering is for small lots. We quote as follows: Tank Steel, 1.20¢ @ 1.30¢; Flange, 1.35¢ @ 1.40¢; Shell, 1.30¢ @ 1.35¢.

Muck Bars.—There have been no recent sales, and we make nominal quotations of \$18.75, delivered at buyer's mill, for best grades.

Bars.—The slightly better demand referred to last week continues, but the volume of business is still insufficient to keep the mills employed to anything like full capacity. Prices have shown no improvement as yet and will hardly do so until there is more business offering. A sale of 500 tons of Common Iron Bars was made the other day at an extremely low price. We quote Iron Bars at 0.95¢ @ 1¢ and Steel Bars at 1¢ @ 1.05¢, with the usual extras. Some mills making a high grade of Bar Iron

are getting slightly higher prices than are quoted above.

Structural Material.—Some bridge work is in sight and is expected to be let within a week or so. The annex to be built to the Hotel Waldorf in New York City will require a very large tonnage in Beams, but will not be ready for some time yet. Prices on Beams are a shade lower and we now quote as follows: Beams and Channels up to 15-inch, 1.20¢ @ 1.30¢; Angles and Universal Plates, 1.15¢ @ 1.20¢; Tees at 1.35¢ @ \$1.40¢.

Merchant Steel.—Business continues very quiet, and is much below what it should be at this time of the year. Prices show no change and we repeat quotations of last week, as follows: Bessemer Machinery, 1.15¢ @ 1.25¢; Open Hearth Spring, 1.50¢ @ 1.60¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.50¢ @ 1.60¢; Sleigh Shoe, 1.50¢ @ 1.60¢; Toe Calk, 1.70¢ @ 1.75¢.

Sheets.—While the demand for Black and Galvanized Sheets is not as urgent as it was, the mills are well employed, and there is still some little trouble in getting shipments as fast as desired. We continue to quote No. 27 Common Iron Sheets at 2.20¢ @ 2.25¢; No. 27 Steel at 2.30¢ @ 2.35¢. Prices on Galvanized Sheets are hardly as firm as they were, and we quote at 75 and 10 and 5 % @ 75 and 15 %, according to order.

Wire Rods.—In the absence of sales we make nominal quotation of \$22.25 at maker's mill.

Pipes and Tubes.—Trade is very fair considering the season of the year, but is confined to ordinary business, no large orders having been placed for some time. Prices are unchanged and depend to considerable extent on the size and nature of the order. We quote Boiler Tubes 70 and 10 % on 2½-inch and smaller and 75 and 10 % on 2½-inch and larger, in carload lots.

Skelp Iron and Steel.—We quote as follows: Grooved Steel Skelp, 1¢ @ 1.10¢, according to width and order; Sheared Steel Skelp, 1.15¢ @ 1.20¢; Grooved Iron Skelp, 1.20¢ @ 1.25¢; Sheared Iron Skelp, 1.30¢ @ 1.35¢.

Wire Nails.—The improved demand noted last week continues, and on most orders coming in customers are insisting on prompt shipments, showing that stocks are very light. We quote Wire Nails at 95¢ @ \$1.05, according to quantity. There is a slightly better demand for Cut Nails, but as yet prices show no improvement. We quote Cut Nails at 90¢ at mill, with usual averages. The Cut Nail factory of the Laughlin Nail Company, at Martin's Ferry, Ohio, is reported as again in operation.

Barb Wire.—Negotiations involving a very large tonnage of Barb Wire for delivery next year are under way, but orders for delivery this and next month are light. We quote Four Point Galvanized at \$1.95 @ \$2.05 in carload lots at mill. Plain Wire is ruling at \$1.20 @ \$1.25 in carload lots.

Connellsville Coke.—As we get closer to the end of the year the subject of the price of Coke for the first three or six months of next year becomes of interest. Already some four or five of the large Connellsville Coke makers have expressed themselves to the effect that higher prices for Coke for next year should be obtained, but as yet no definite plan or arrangement has been suggested that will secure this. Some contracts for Furnace Coke made last

summer were interfered with by the strike and instead of expiring at the end of this year, as originally intended, will extend into April or May of next year. For the week ending November 3 there were 14,024 ovens in blast in the Connellsville region, and 3550 idle, the total production for the week reaching 139,588 tons. Compared with the production of the previous week this was a decrease of 2234 tons. In the active list there was a net decrease of 330 ovens. We continue to quote Furnace Coke at \$1 and Foundry Coke at \$1.15 to consumers, in tons of 2000 pounds. In several cases our quotation on Furnace Coke has been shaded 10¢ per ton.

(By Telegraph.)

We are officially advised that the statement published in the Pittsburgh papers to the effect that Brown & Company, Incorporated, of the Wayne Iron & Steel Works, at Pittsburgh, had increased wages of their puddlers from \$4 to \$4.40 per ton is wholly untrue. There is no foundation whatever for the statement.

On Tuesday, the 13th inst., operations were resumed at the plant of the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., with non-union men. The start is said to have been very successful, a large number of skilled workmen having been obtained from Pittsburgh, Beaver Falls, Brad-dock and other places. The men are being cared for in a hotel owned by the firm and located near the works. Before the end of this week additional departments of the plant are expected to be put in operation. A start has also been made with non-union men at the tin plate plant of Wallace, Banfield & Co., Limited, at Irondale, Ohio. The resumption of work at these two plants with non-union men is the entering wedge of what promises to be a very bitter fight between the Amalgamated Association and the firms composing the Tinned Plate Manufacturers' Association.

Financial.

During the greater part of the week under review financial circles have been agitated by rumors and counter rumors regarding a new Government bond issue. All doubts were, however, set at rest on Tuesday afternoon when Secretary Carlisle made public a call for bids for a new series of 5 % bonds to the amount of \$50,000,000. These bonds will bear the same date as those issued last February, of which series they are practically a continuation, instead of the actual date of issue, and will mature in a little over nine years instead of ten years. Consequently the premium will be smaller. It is understood that a syndicate of banks and trust companies in this and two or three other money centers are likely to make a bid for the whole issue on a 3 % basis. Whether this be so or not, bankers generally believe that owing to a large surplus cash holdings of the banks just now, there will be no trouble in floating the bonds at once, but that the entire issue will be considerably oversubscribed. Bids for the new bonds will be received up to noon on November 24.

The declared object of the loan is the weak condition of the Treasury gold reserve and its unfavorable effect upon foreign credit. The present gold balance is about \$62,000,000. It is expected that the new bonds will bring at least \$58,000,000 more into the Treas-

ury, restoring the gold reserve to about \$120,000,000. The Treasury's November estimate reckoned the total gold coin and certificates in circulation in this country, outside the Treasury, at \$564,400,000. Of this sum less than \$200,000,000 is held by the national banks, of which \$75,000,000 is in possession of those in New York City.

The loan appears to be extremely popular in financial and business circles, the belief being expressed that it will tend to stimulate trade and speculation, and restore confidence by removing the danger of further large gold exports. The question of possible imports of the metal is also discussed. Combined with the gratifying results of last week's elections, which, by changing the complexion of the next Congress, have apparently removed the tariff question beyond the reach of further agitation for some time to come, the new bond issue has already had a favorable influence in Wall street. The feeling there is decidedly more cheerful, and greater activity has developed in speculation, accompanied by higher prices in both stocks and bonds. On Monday the buying orders from the outside public were larger than they have been at any time during the year. London has also been making unusually heavy purchases. The loan market at last shows signs of reviving strength, and the foreign exchanges declined sharply on the news of the expected bond issue, removing the fear of any further outflow of gold at present. Whether these circumstances are reliable indications of a coming general revival of confidence and business activity, or whether the improvement is to be only temporary, are matters of controversy. But it is believed by a large number of persons in the financial world that a real and tangible improvement has set in, and they point to the various conditions favorable to improvement which now exist as grounds for their conviction.

Notwithstanding the most strenuous efforts of the "bears" on the Stock Exchange, by which they were successful in depressing sugar stocks to 91½, and shaking some of the "grangers" on the strength of an unfavorable November Government crop report, the stock market has gained steadily in strength and activity. As previously intimated, a more healthful tone has been imparted to it by a marked revival of interest in both speculative and investment buying of stocks by the outside public, considerable foreign buying of securities having contributed another element of encouragement. With a very few exceptions, the whole list of stocks exhibits a gain over the prices of a week ago. Sugar has again monopolized the lion's share of the week's dealings, that volatile stock accomplishing rather more ground and lofty tumbling than usual. Chicago Gas has also been an object of considerable manipulation by the "insiders," and has scored a smart advance. It is said that a powerful "bull" combination has been formed to push this stock and certain of the granger group.

Louisville & Nashville stocks have been in good demand and stronger on the news of considerable gains in the October net earnings of the road. St. Paul has scored a handsome advance, despite its unfavorable statement of earnings for the first week in November, and Burlington & Quincy and Rock Island have also profited by the rising tide. A buying interest in Atchison followed on the publication of Expert

Accountant Little's report, which makes a rather better showing than was generally looked for. Altogether, while there has been no violent boom in stocks prices have improved materially, and trading is considerably more healthy.

The activity of the general bond market during the week under review has been very marked. The demand for prime issues of railway and miscellaneous bonds has been sufficiently urgent to cause a sharp advance in prices both for these and lower class securities. Foreign houses have figured largely as buyers. Some of the low priced specialties, such as Missouri Pacific, have been again brought into notice. The granger issues, notably St. Paul, have been in great request, and a strong buying movement was experienced in Atchisons. The market closed firm, with a scarcity of some of the favorite lines.

The loan market has begun to exhibit signs of reviving strength, and actual rates for money are somewhat firmer, although quoted rates do not as yet show any great change. Money on call is still quoted at 1%, but this rate is more firmly adhered to than has been the case lately. Time money shows signs of better conditions. Many banks are unwilling to contract for long time loans at current rates, believing that the status of the market will be materially changed within a short time. The offerings of short time money are, however, still abundant and the demand has not increased to any large extent. Quoted rates are as follows: 1% for 30 days, 2½% for 60 days to four months, 3% for five to six months, and 3½% for longer dates.

The market for commercial paper is reported as hardening, and large buyers are asking for higher rates. The supply of prime material does not, however, expand to any great extent. Quotations are a trifle better, namely: 3% for 60 to 90 days for double names; 3½% @ 4% for high grade single names, and 4½% and upward for names not so well known.

Sterling exchange is considerably weaker, the announcement of the Government bond issue having exercised a depressing influence. Offerings of bills against London purchasers of securities are larger than the demand from remitters, which is comparatively small. Actual business was done on Wednesday at \$4.86½ for 60 days; \$4.87½ @ \$4.87½ for demand; \$4.87½ @ \$4.87½ for cables, and \$4.85 for commercial.

Domestic exchange on New York is quoted as follows, at the places named: Chicago, 15¢ premium; Savannah, buying ½¢ discount; selling ½¢ @ ½¢ premium; New Orleans, 100 discount, bank par; Charleston, buying ½¢ discount, selling par; San Francisco, sight 7½, telegraph 10.

Metal Market.

Pig Tin.—Very little change in prices has taken place during the past week. Values are down to a level that tends to check bearish operations, but low prices have failed to weaken live buying interests. In short, it is a lethargic market as far as speculation is concerned, and few trades have been made except on more or less peculiar terms as to options and delivery that have a tendency to mystify rather than instruct the outside buyer. That there is some motive in this can hardly be denied, and that it is

a means to speculative ends goes without the saying. It is an unmistakable fact, however, that purchases by out of town dealers and by consumers have been only fair and that sales are still being made outside at prices unusually close to those that go into general circulation as being net cash rates for spot stock. Current month delivery is now at 14.55¢ @ 14.60¢, net cash. Spot prices are about the same. Near future deliveries have been sold at 14.50¢ and were offered at that for January and ahead.

Copper.—There is no decided change but the market has a weaker appearance and buyers are extremely conservative, not only in placing orders for future delivery, but in purchasing against immediate wants. It would seem that little concern is centered upon the endeavors of producers to restrict production, also that experience has been a good teacher and that consumers have settled down to the opinion that there will be enough Copper of all kinds to go around. Lake Superior Ingot may be secured at 9.50¢ easily. Electrolytic is at 9.25¢ bid, 9.35¢ asked, and common casting stock at 9¢ @ 9.12½¢, according to brand and quantity.

Pig Lead.—Some efforts have been made to give the market more tone, and in that connection reports were sent out of large business having been effected. Those reports got into print. The alleged large business cannot be traced. As a matter of fact, more sellers than one are on a still hunt for orders for ordinary brands at 3.12½¢, near future delivery, and efforts to draw custom at 3.10¢, later delivery, have been slimly rewarded.

Spelter.—Orders in this quarter have fallen off, and Eastern consumers figure as very indifferent buyers at the moment. Galvanizers, who were liberal buyers in some quarters a short time ago, have also modified their offers, and upon the whole the support is less promising at the present time than it was a week or ten days ago. It is easy to buy ordinary Western brands at 3.40¢ @ 3.45¢, and some could probably be secured at 3.35¢, delivered here or at common point.

Antimony.—Nothing more than routine business has been transacted, and the demand is exceedingly commonplace. Selling pressure has modified somewhat with the effect of steadying prices at about 7.35¢ @ 7.50¢ for Hall's, and 8.50¢ for Cookson's, on the spot.

Nickel.—Prices are still extremely variable, with the range of 38¢ @ 45¢ quoted, according to quantity and delivery.

Tin Plate.—Very little change has taken place in the character of business or in the demand. Many of the large consumers place orders direct, taking all advantage that there may be in purchasing for future shipment and go indifferently about it. From other sources there is merely routine demand and business in spot goods has been rather below than above the average for this season of the year. Supplies on spot have accumulated somewhat and the assortment is also rather better. Along with confirmation of reports of quite liberal stocks at foreign producing points this serves to keep prices rather weak. Spot quotations for wholesale quantities are as follows: Charcoal Tins: Melyn Grade, one-half X IC, \$5; IX, \$6.50; Livsane, &c., IC, \$4.30; IX, \$5.25; Alla-

way Grade, \$4.25; IX, \$5.05; Siemens Steel, IC squares, &c., full weight, \$4.37½ basis; 100 lb, \$4.10 basis. Bessemer Steel, IC squares, &c., full weight, \$4.30 basis; 100 lb, \$4 basis. Coke Tins, IC, 14 x 20: Bessemer Steel, full weight, \$4.12½; 100 lb, \$3.77½; 95 lb, \$3.67½; 90 lb, \$3.57½. Charcoal Tines: M. F., IC 14 x 20, \$6; IC 20 x 28, \$12; Worcester, IC 14 x 20, \$4.75; IC 20 x 28, \$8.60; Alyn, full weight, IC 14 x 20, \$4; IC 20 x 28, \$8.05; Alyn, 100 lb, IC 14 x 20, \$3.85; IC 20 x 28, \$7.60; Dean, full weight, IC 14 x 20, \$4.05; IC 20 x 28, \$8.10; 100 lb, IC 14 x 20, \$3.90; IC 20 x 28, \$7.80; D. R. D. Grade, full weight, IC 14 x 20, \$3.90; IC 20 x 28, \$7.85; 100 lb, IC 14 x 20, \$3.85.

New York.

Office of *The Iron Age*, 96-102 Reade street, New York, November 14, 1894.

Pig Iron.—The market continues dull, and there are no indications of an expanding demand. As yet there has been no serious talk as to contracts for standard Northern brands for next year. From New England come complaints of very low prices on Southern Iron, while Buffalo furnaces are unsettling matters along the lower Hudson by putting in sample lots at low prices. In the Cast Iron Pipe trade everything is very quiet. Some negotiations are on for spring delivery, but there does not seem any immediate chance that business will result therefrom. We quote standard brands \$12.25 @ \$12.50 for No. 1; \$11 @ \$12 for No. 2; \$10.50 @ \$11 for No. 2 Plain, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12 for No. 1; \$10.50 @ \$11.25 for No. 2; \$10.25 @ \$10.75 for No. 3; \$10.50 @ \$10.75 for No. 3 Soft, and \$10.75 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$10 @ \$10.40.

Spiegeleisen and Ferromanganese.—No business of consequence is noted. We quote nominally \$20.50 @ \$21 for 20% Spiegeleisen and \$48 @ \$50 for foreign Ferromanganese, tidewater.

Billets and Rods.—business in this section is light. Wire Rods are lower at \$24.75 @ \$25.25, tidewater, while Steel Billets may be quoted nominally \$18 @ \$18.25, tidewater. Basic Open Hearth Billets are selling at \$24 @ \$25, delivered.

Steel Rails.—One of the Eastern mills reports sales aggregating 6000 tons for prompt delivery. A lot of 1400 tons, for a Texas road, has probably gone to Pittsburgh. There are rumors afloat that the agents of one Eastern mill, which has been idle for this year, have received instructions to book orders. There is little doing in the Girder Rail trade, but the prospects are that competition will be quite lively next year. One large Pittsburgh mill which has been rolling some Girder Rails to help out a works long identified with this specialty, is expected to go into this trade on its own account. Another large works in Western Pennsylvania has turned up rolls for this trade, although it has not appeared in the market. The Huntingdon order of foreign Rails is now stated to have been 7000 tons.

Track Material.—We quote as follows for small lots: Spikes, 1.40¢ @ 1.60¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

Manufactured Iron and Steel.—No contracts of any magnitude have been placed during the past two weeks. There is quite a good deal of work coming up, and some very large buildings are expected to be closed during the next few months. Competition along the whole line continues very severe. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.25¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.35¢ @ 1.50¢, on dock. Steel Plates are 1.25¢ @ 1.40¢ for Tank; 1.40¢ @ 1.50¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.15¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.15¢; Soft Steel Bars are 1.10¢ @ 1.30¢; Scrap Axles are quotable at 1.30¢ @ 1.50¢, delivered; Steel Axles, 1.30¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢; Best Iron Boiler Rivets, 2.90¢ @ 3¢, delivered; Cotton Ties, 67¢ @ 75¢ @ 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.60¢ @ 1.70¢, and Sleigh Shoe, 1.20¢ @ 1.25¢; Tire, 1.25¢ @ 1.30¢, and Spring, 1.65¢ @ 1.70¢, delivered.

Birmingham.

(By Telegraph.)

BIRMINGHAM, ALA., November 14, 1894.

The market is in a waiting condition. The feeling North seems better, but here no improvement is seen. Sales are heavy, but prices are lower. Several large orders are reported up to 10,000 tons. The local mills and foundries have done some very heavy buying of No. 3 Foundry and Gray Forge. Orders cover six months deliveries. Sales are not quite equal to the demand as yet. Stocks are accumulating on higher grades, while lower grades are short and pushing for shipment. Freights will increase eastward 25¢ on January 1. The report regarding the Japanese order of Cast Pipe, amounting to over \$800,000, as having been taken by an Alabama concern, is not yet confirmed. The agent negotiating the deal has not yet reported, but the probabilities are that the sale will be captured here.

Cincinnati.

(By Telegraph.)

Office of The Iron Age, Fifth and Main Sts., CINCINNATI, November 14, 1894.

While the volume of business in this district has not been large, yet there are some encouraging features to the market. The fact mentioned last week by *The Iron Age* that production of cheap Pig Iron could not be increased much more and that stocks were reduced during the month of October gives an undertone of confidence that is highly gratifying, and some of the strong producers in the South are not disposed to sell except at an advance, but as yet there is no quotable change in prices, although there is evidently a stronger undertone all around. The sales here were slightly enlarged. There was a better jobbing trade and there were several sales of 500 to 600 tons. There were also reports of pretty large buying by Southern Iron Pipe works. The elections last week have had a salutary effect upon the market. The

demand here, however, has been pretty freely supplied at previous prices, and the most that can be said is that the tendency seems to be upward. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$10.00 @ \$10.25
Southern Coke, No. 2.....	9.10 @ 9.75
Southern Coke, No. 3.....	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1....	14.50 @ 15.00
Ohio Soft Stone Coal, No. 2....	14.00 @ 14.50
Lake Superior Coke, No. 1....	12.00 @ 12.50
Lake Superior Coke, No. 2....	11.00 @ 11.50
Hanging Rock Charcoal, No. 1..	16.00 @ 16.50
Hanging Rock Charcoal, No. 2..	15.50 @ 16.00
Tennessee Charcoal, No. 1.....	13.00 @ 13.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	15.75 @ 16.75
Lake Superior Car Wheel and Malleable.....	14.25 @ 14.75

Forge.

Gray Forge.....	8.50 @ 8.75
Mottled Coke.....	8.25 @ 8.50

British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, November 14, 1894.

Pig Tin prices declined during the week on outside realizations, and in the face of more or less "bull" support. The selling was prompted by adverse advices from New York and the Continent, together with uncertain future here and fears of further unloading by large holders. Lately the market has hardened under the influence of more active cash demand and smaller offering of futures. Business to-day was at £66. 2/6 for prompts and £66. 7/8 for three months' futures.

Copper has undergone very little change. Some realizing has been done by tired holders, owing to inability of producers to effect an agreement and freer American offerings. Otherwise speculation is on a very limited scale, and trade demand was moderate until the last few days. Merchant Bars are to-day quoted at £40. 2/6 for prompts and £40. 10/ for three months' futures. Best selected English quoted at £42. 15/ @ £43.

Tin Plate has been dull and prices are easy. Buyers very uncertain and waiting. Transactions limited. Owing to lowness of prices offered several works have been shut down. The results of the elections in the United States have also had an adverse influence upon the market. Large shipments have been made, chiefly on former orders. Stocks at shipping points estimated now at about 200,000 boxes, a reduction of 30,000 boxes the past week. Swansea quotations are as follows:

Bessemer Cokes, 14 x 20.....	9/9 @ 10/3
Siemens Cokes, 14 x 20.....	10/ @ 10/3
J. B. Steel Cokes, 14 x 20.....	10/0 @ 10/3
Ternes, 20 x 28.....	19/0 @ 21/
Charcoals, 14 x 20.....	11/ up. #

Pig Lead is in moderate demand and prices are steady at £9. 15/ @ £9. 17/6 for Soft Spanish.

Spelter has remained quiet and prices are easy at £14. 10/ for ordinary Si-lesian.

Pig Iron warrants have undergone scarcely any change. Late dealings were at 42/6 @ 42/7 for Scotch, 35/7½ for Cleveland and 43/9 for Hematite.

Trade Publications.

I. P. RICHARDS of Providence, R. I., has issued pamphlets describing the United States standard punches and dies made by him for punching iron and steel plates used in the construction of boilers, bridges, ships and all other kinds of riveted work.

PNEUMATIC PUMPS AND LIGHT AIR COMPRESSORS are described in a catalogue by the Merrill Mfg. Company of 126 Liberty street, New York. In this method of elevating liquids the compressed air is furnished by a simple air compressor actuated by any convenient power situated in any convenient place, irrespective of the location of the source of water supply. A small pipe conveys the compressed air any distance or in any direction to a submerged pneumatic pump, adapted to all places, from which water or other liquids are required to be elevated or conveyed. The apparatus contains no moving pistons, stuffing boxes, or other parts which require lubricating, wear out or add friction. It consists of a plain, simple water chamber, with no complicated or movable mechanism about it.

THE BOLT, NUT AND SPECIAL MACHINERY built by the Acme Mfg. Company of Cleveland, Ohio, is fully described in a catalogue recently issued. The descriptions cover all the well-known forms of bolt cutters, nut tappers and bolt heading machines made by this company.

FROM THE AMERICAN WELL WORKS OF Aurora, Ill., we have received a catalogue describing their well drilling tools and appliances. Their elliptical drilling machine will handle any style of drilling tool. It can be operated by an independent engine or by horse-power, as the case may require. It is fitted with power pumps for the water service, but duplex steam pumps may be added when steam is used as the motive power. In the pump department they describe a novelty in water cylinders. It is a heavy brass cylinder and brass ball valves, with a patent foundation or seat that can be placed anywhere in the pipe casing the hole, and which will permit of the water cylinder and foundation being removed at any time and placed lower should circumstances require. This device does away with extra line of column pipe inside the well to sustain the water cylinder, and also increases the capacity of the well.

The Proposed National Association of Manufacturers.—A committee of the Manufacturers' Association of Cincinnati and Hamilton County, Ohio, consisting of W. T. Perkins, Frederick Pentlidge, B. W. Campbell, H. C. Yeiser and Chas. F. Thompson, have issued a call for a conference to be held in the city of Cincinnati on January 22, 1895, for the purpose of general interchange of views looking to the formation of a National Association of Manufacturers, which shall embrace among its purposes: 1. The advocacy of carefully considered legislation to encourage manufacturing industries of all classes throughout the country. 2. The discussion of ways and means whereby trade relations between the United States and foreign countries may be developed and extended. 3. The establishment in South American capitals and other desirable points of permanent expositions for the display of American products. 4. Such other topics as may be agreed upon by the convention. It is desired that this convention shall be non political, non-partisan and non-sectional. The invitation extended is without limit as to number of attendants, and is cordially extended not only to accredited delegates from organized exchanges representing manufacturing interests, but to any individual manufacturer who may have the promotion of the general good by organized efforts sufficiently at heart to be willing to meet with them.

HARDWARE.

Condition of Trade.

THE INTERRUPTION TO BUSINESS from the engrossment of the public mind in political matters prior to the election has been succeeded by a somewhat increased activity, orders the present week coming in a little more freely. There is a perceptible improvement in the feeling that pervades the trade, and a confidence that more stable conditions will prevail which will serve as the basis for a gradual return to prosperity. The orders which are being received call for a good proportion of winter goods, this class of trade having been stimulated by the advent of cold weather, especially as a good many merchants, owing to the prevailing conservatism, had been more than usually late in making their purchases. There is also a fair demand for general Hardware, and on the whole the condition is better than a few weeks ago. The volume of business is not, however, on the whole up to the average, while it shows a decided improvement over last year. The tone of the market in the matter of prices is far from satisfactory, on many goods quotations being weak and irregular. The trade are, however, generally coming to accept the fact that prices on the whole are likely in future to rule low, owing to low prices of raw material, increased competition among manufacturers and diminished cost of producing goods. Owing to these influences a return to former high prices is generally regarded as unlikely. At the same time there is no doubt that prices ruling on many lines of goods are exceedingly close, and, with a recovery in raw material and a fair increase in the demand, it is thought not unlikely that advances in some lines may be expected. Whether or not the bottom has been surely reached on goods in which marked declines have taken place during the past year or two is a question on which there is some difference of opinion. In this condition of things the trade are naturally purchasing with a good deal of conservatism, and it is difficult to obtain a line of goods in which there is any disposition

on the part of careful buyers to place orders in excess of early requirements.

Chicago.

(By Telegraph.)

Shelf Hardware is doing fully as well as at any time this fall. The election excitement last week caused some little falling off in daily sales, but mail orders at the beginning of the present week are heavier than usual, which brings up the average. The conditions which have kept trade steady during the past two months still exist. Orders are small but frequent, showing that country merchants are being compelled to constantly replenish their stock. Staple goods are comparatively quiet, as is usual with the approach of winter. Seasonable goods have been in rather light demand, owing to the very mild weather. But the past week winter seems to have set in in earnest and a much stronger demand is now expected for all classes of these goods. Tinware and House Furnishing Goods have been in somewhat less demand than was reported last week, but on the whole this class of trade is doing considerably better than during the early fall months. The Heavy Hardware business has improved considerably. Inquiries are better and consumers now are talking more favorably of stocking up on staple goods.

St. Louis.

(By Telegraph.)

The jobbing Hardware trade report a good demand for staple lines and a heavy demand for seasonable goods. The cold weather which seems to have swept the entire country has caused a rush for seasonable goods, and as above stated a heavy demand is reported. The result of the election was the most talked-of subject for several days after the election took place, and the result seems satisfactory to the Hardware trade without exception. The question of prices is what worries the trade just now even more than the volume of trade. The recent advance in Iron Rivets was the first item which the trade have had to make an advance on for some time, and they only hope that other lines will follow. Barb Wire is in a mixed condition on account of the reported failure of the manufacturers to hold together, and lower prices are anticipated. Wire Nails are also in bad shape, and any improvement in prices seems out of the question, at least until the spring trade opens. Tin Plates, Galvanized and Black Sheets, Corrugated Iron and House Furnishing Goods are all heavy sellers. Heavy Hardware

is improving, especially Wagon Stock. Collections are good.

Boston.

BIGELOW & DOWSE COMPANY.—In New England there has been no anxiety over the results of election to interfere with trade. Every one seemed satisfied and safe in the thought that all he had to do was to deposit his vote on election day and the change was sure to come. For this reason we have had no great excitement and men have had time to plan and to transact their regular business, so that there is a considerable improvement in its volume. This change commenced some time ago and it should continue now that the whole community have a more secure and better feeling of confidence in the future. Thus far there have been but few changes in prices, still it is an opinion frequently expressed that values are as low as they will be. While we may look for future improvement in general business from the result of the elections, we are experiencing a present benefit from the change in the Cutlery tariff. Prices are made attractive and sales are materially increased. Nature, too, is lending a helping hand by giving us ice and snow unusually early. This insures a very large sale for Skates, Sleds, Snow Shovels and other seasonable goods. This trade is now very active and stocks are being broken in sizes and factories are running overtime to meet the demands.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade during the last two weeks has been largely interrupted from the fact that throughout the country elections and politics appeared to have been the sole topics of conversation, and have, to a great extent, diverted attention from business. As a rule, for some days prior to the election a large number of customers in interior towns and cities give more attention to discussing the political situation than they do to their daily routine of business. Then comes election day, and further time is taken to discuss the results for some days afterward. The consequence has been a temporary interruption of trade.

Collections have suffered correspondingly with trade, from the same cause; consequently collections have been less satisfactory. We feel, however, we will have an improvement beginning with the present week. Prices remain without any material change in value.

We have heard no one intimate otherwise than that the results of the election would be a stimulus to trade, as the belief is that (although elected members for Congress can have no immediate voice in legislation, it being a full year before they will be called upon to discuss legislation) any action taken in the December Congress to disturb business will be met with popular disapproval.

The more quickly confidence can be fully restored the more quickly will trade expand, and the unemployed

be taken from the street corners and saloons.

It is assumed by some that vindictive measures may be attempted in the short session of Congress to push tariff agitation further to the front, which may temporarily at least disturb or retard trade, but it is not likely that anything radical will now be done.

It has been unfortunate for the country that the administration party, although Representatives were elected on the same platform, have been divided into three and four factions, many of them without any positive or defined policy, many of them controlled by the wave of public opinion of the day only, many of them diametrically opposed to the opinions of their co-workers and radically opposed to each other on the vital issues of both tariff and finance.

But the country has spoken in distinctive terms and has shown its desire to end obstructions to trade, commerce and employment. The results of the recent elections can in no other way be accounted for.

It has been estimated from more than one source, and recently, we understand, confirmed by Mr. Gompers (the labor leader), that an average of 3,000,000 people have been out of employment during the last year, which represents the same number of days lost labor. At an average of \$1.50 per day it would amount to \$4,500,000 per day. Taking 300 working days in a year, it will reach the enormous sum of \$1,350,000,000 loss of wages for the year, which is one-fourth greater than our present entire national debt. In this estimate no consideration has been taken of the millions and millions of loss to merchants and manufacturers, nor of the thousands of millions in reduced valuation of securities of railroad and other stocks held by needy investors, nor the loss sustained by our banking institutions.

These are not a manipulation of figures, but solid facts, and when we take into consideration loss as above named in excess of the loss of labor it far exceeds the cost of the Civil War.

Nor is this all. Let us say we need to begin over again on the ladder of prosperity, but how can we? How many wage earners have contracted debts which will require years to pay out of their savings. Even in prosperity, how many months of unpaid rent stare many wage earners in the face? How many unpaid grocers' bills, which will tempt many to leave their old and familiar neighborhoods, in order to avoid being dunned for their first savings?

When one stops to think over the uncertain causes of this great depression and reaches the fountain head, and finds a solid breastwork of Government surplus, gold lying in the vaults of the United States Treasury, it gives college trained theorists an opportunity to successfully make the masses think they were taxed unnecessarily in order to keep this surplus intact to protect the Government obligations. Well—we have no surplus now for theorists to complain of.

A statement has recently been made by Charles Emory Smith of our city that from 1870 to 1890 "the American people made and saved more than had been made and saved by all the world in the first 18 centuries of the Christian era."

While the above might seem incredible, he has given authentic statistics to prove the assertion, showing the wealth of the world in 1800 was \$36,000,000,000. This amount represents what they made and stored up from preceding ages, which was manifestly the world's wealth. Now, according to the statistics, we have the following: In 1870 the wealth of the United States was \$27,000,000,000 and in 1890

it was \$64,000,000,000; net gain \$37,000,000,000, or at least \$1,000,000,000 more than the estimate of what the world had saved in the first 18 centuries of the Christian era.

Unfortunately at this writing statistics do not give us the gain during the years 1891 and 1892, which, however, were far greater than any two preceding years.

With this showing that the American people had not only made, but made and saved, \$1,000,000,000 more than was made and saved in the first eighteen centuries of the Christian era, one would naturally ask, Why try for new gods?

Any deduction from the above savings must be deductions made from the effect of the depression of the last two years from idleness, depression, depreciation and reduction of value.

But our country should not be discouraged or disheartened. The path to prosperity is straight, the road comparatively clear from obstructions, the sky in the distance is blue and bright, and with the exception of an occasional vapory cloud, no gathering clouds are seen in the distance.

We may have a few short months of Congressional legislation, making a foggy atmosphere, but be cheerful. Our country will soon ascend the ladder of success and reach the high pinnacle of prosperity. Prepare your business for it, for it is just as sure to come in the near future as that summer will succeed our present winter.

Barb Wire may not then be sold at 2 cents a pound, Wire Nails may not then be sold at \$1 per keg, Cut Nails at 85 cents per 100 pounds, Wheat may not be sold at 50 cents a bushel or cotton at 5 cents a pound, but buyers will have more money to make purchases at a higher value, and can have money to replace their exhausted funds in the savings bank recently withdrawn, and money to redeem mortgages recently placed upon homes to buy food.

A workman a few days ago passed a clothing house simultaneously with the writer and saw an overcoat marked at \$10. He remarked thus: "If overcoats were \$10 per dozen I could not buy one half dozen." The writer remarked, "If you and your family can retain your health, in a few years you will see the day when you can pay a full price for any comfortable over garment."

The writer has just returned from a launch in our city, at Cramp's shipyards, of the new American Line passenger steamer "St. Louis," which has been in course of construction with some 1000 men for the last 15 months, the largest ship ever launched in this country, to ply between this country and England, under the American flag. The occasion was honored by the presence of President Cleveland, the entire Cabinet and their families, and the christening was performed by Mrs. Cleveland. Along side of the "St. Louis" was the United States cruiser "Minneapolis," looking comparatively small, but both showing the progress of American shipbuilding and the development of this industry in this country during the past two years. This was made possible by an act of Congress, and such legislation is necessary if we are to secure the markets of the world.

Cleveland.

THE W. BINGHAM COMPANY.—Although the past two weeks have been given over pretty generally to political discussions, still the general trade has kept up fairly well. Now that the thing is settled we look for a good, steady business, but no boom; we do not want one. Although prices on

most lines are very low we do not look for higher ones at present. The lines that are selling chiefly are Shelf Hardware and season goods. The beautiful weather we have been having until very recently has somewhat interfered with the sales of the latter line. The demand for Wire and Wire Nails is still unsatisfactory, as are also the prices, which are weak. There are some inquiries for these lines for delivery after the first of the year, and some orders are being placed for such deliveries based upon the present price, and from the present outlook we take it that it is a good purchase for the buyer. The week just past having been one of very disagreeable weather has created quite a demand for heating Stoves and articles that follow in that line. Collections are fair.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Little of importance has occurred in the Hardware and metal trade to note in the past six weeks. A moderate volume of trade and fair collections appear to be the general report.

A slight advance in the price of wheat within the past few days has a tendency to cheer the hearts of the farmers. It is to be hoped that they will not be tempted to hold their grain for further and greater advances, which may not be realized.

A goodly number of large vessels in our harbor waiting their grain cargoes is indicative of a large surplus for shipment, which will in due time be en route for foreign ports.

San Francisco.

MILLER, SLOSS & SCOTT.—Since our last report business has been more or less upset, as is usual during the days just preceding an election, but we hope to see a continuation of the gradual increase which we have been able to advise for some months past. While there is at the present time no real reason for anticipating a decided increase in business in the immediate future, it is cheerful to find that our people are all talking more hopefully and affairs seem to have assumed such shape that we can confidently expect that better times are near at hand.

Though collections have been fairly good for some months past, money has been coming in more freely during the past week, which we consider a very good sign when we bear in mind that it is the week before election.

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—A general review of the business situation at this date discloses no new features of special interest. The greatest disturber of trade was the political campaign, which excited more interest than usual, and for that reason has been diverting the attention of all classes of business men away from their business to a greater or less extent. As a result, there has been a perceptible falling off in the volume of orders received. There is now comfort in the fact that the political conflict is over and the business world generally can settle down with confidence to renewed activity. Mild and pleasant weather has had some effect in causing a halt in the movement of seasonable goods. Cooler conditions would undoubtedly impart an impetus to trade, which we hope to report in our next communication.

New Orleans.

A. BALDWIN & CO.—Business has been very quiet during the past two weeks. We, however, look for a decided improvement soon. The situation during the past few days seems to indicate a return to stricter attention to business now that the election is over. The cool snap has created a good demand for Stoves and other seasonable goods and the output of this class of goods is considerably above an average year.

Baltimore.

CARLIN & FULTON.—The elections now being over, with their results gratifying or disappointing according to the point of view, we may now look for an improvement in business, which would be realized very early were there only better prices obtainable for the great staples of the agriculturist.

Present values are undoubtedly unsatisfactory to all manufacturers, but advances in prices made by resolution, whether by individual, or by trust, or by combination, amount to nothing unless the demand from the buying public is sufficient to keep the factories fully employed and the production not in excess of the consumption.

That the results of last week's elections were of paramount importance cannot be disputed, for far above the feelings of either regret at defeat or of exultation over victory are the thoughts that party treachery has been rebuked, rascality has been condemned, and will be punished not merely by one party, but by the united better elements of both, and as the next Congress will be constituted tariff agitation, whether for further reductions or for the enactment of higher duties, will be useless, and the present bill will have an opportunity for a practical test and the country will be blessed with rest.

To use the words of the president of the Boston Chamber of Commerce, in a recently published letter, "while business up to the present has not shown the improvement expected, yet the situation is undoubtedly better." And in confirmation of this statement may be read the remarks from the other extreme point of our land, the city of New Orleans, where the president of its Board of Trade writes "that in spite of the low prices of both cotton and rice, the crops were never made so cheap, the food crops were immense, the farmers are but little in debt and there is every reason for good trade."

We hope that in a little while we may be able to report that the country has awakened to the advantage of replenishing depleted stocks with goods which, at to-day's prices, offer investments of undoubtedly greater promise than any other in the market.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—As we approach winter the demand for goods for that season has quickened, and reasonably fair quantities have been moving. The weather has been favorable, and indeed it has been a notable fall in this respect. Just now it is colder, and the temperature is low enough to indicate that the freeze up for the winter is at hand.

Stove Boards, Snow Shovels, Sleds and Skates are in demand, and there is a good deal of activity manifested in getting ready for winter. Farm work is well up, and favorable preparations

are made for next season's crop. Our lumbermen are busy getting into the woods, and the cut is going to be large.

The mines are increasing their output, and their demand for goods is on the increase.

The result of the elections is also exercising a very favorable influence on business. This is not only because the belief is now strong that there will be but little further effort at "tariff reform" during the present Administration, but also through the great feeling of relief in the apparent fact that Populism has received a fatal blow. This of itself is enough to rejoice over. Here in Minnesota Populism has never reached the proportions that it has in some other Western States, but with the protracted dull times, and under the leadership of smart, unscrupulous demagogues, there were reasons to fear its rapid growth. It is greatly to the credit of the intelligent members of the Democratic party that when they saw the danger from the other end of their party going to Populism they went over immediately to the Republican side and voted for Governor Nelson. This very unusual incident shows the real strength of the American people and that patriotism is still above party.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in very much the condition referred to in our last report. The demand is fair and some heavy orders have been placed, with some large shipments that buyers might have the advantage of water transportation. The market continues to be represented by the quotation of 95 cents, f.o.b. mill, for carload lots, with a 60-cent average, but this figure is shaded and on attractive orders 90 cents is obtainable.

Chicago, by Telegraph.—Factory prices recently have settled down to the level of \$1, Chicago. This is due to the low rates made by water from Eastern points, which established a delivery price that had to be met by manufacturers in interior localities. The large contracts which are usually placed for late shipment before the close of navigation were attractive, and the lowest rates were made to secure them. Several important transactions of this character took place during the past week. Now that the season of navigation is about over and shipments must be made by rail, there is an expectation that prices will be firmer. Jobbers are of this opinion as well as manufacturers. Small lots from stock are quoted at \$1.10.

Cut Nails.—There is a fair demand for Cut Nails, but the volume of business is not especially heavy. Prices are on the basis of 90 cents for carload lots on dock, New York, with a 60-cent average, but this price is shaded on attractive orders. The quotations of the mills are apparently based on the price of 75 cents to 80 cents, f.o.b. mill, with 60-cent average. Small lots from store in New York are quoted at \$1 to \$1.05.

Chicago, by Telegraph.—The volume of business last week, as reported by

manufacturers, improved considerably over the average of the preceding weeks. Single orders are no larger, but continue to run to carload lots, with an occasional call for two carloads. Factory prices, Chicago delivery, are unchanged at 90 cents for 60 cent average. Small lots from stock are quoted at \$1.

Barb Wire.—The Barb Wire market is, as usual at this season, quiet so far as actual business is concerned, the demand being light and comparatively few orders being placed for next spring. In the matter of price the tone of the market is not quite so strong as it has been, owing in part to rumors of some disagreement among the manufacturers. In this condition of things some of the large trade are deferring placing their orders, awaiting developments. Quotations on Four-Point Galvanized in carload lots are as follows: Pittsburgh, \$1.90 to \$2; Cleveland, \$1.95 to \$2.05; Cincinnati, Allentown, Chicago and New York, \$2.05 to \$2.15.

Chicago, by Telegraph.—Not much business has recently been done in entering new orders for spring delivery, so far as can be ascertained. Country merchants are making some inquiry for shipments beginning in January, but are not yet inclined to indicate how much their purchases will be. They are disposed to wait until they are thoroughly assured that prices have touched bottom. Such harmony exists among the Barb Wire manufacturers, however, that there is strong reason to believe that the present basis of values will be maintained. Orders for prompt delivery are now small, owing to the prevalence of winter weather throughout the Northwest. Trade continues in fair volume with Southwestern points, which, however, only take a small part of the output of this section. Jobbers quote small lots of Galvanized at \$2.25 from stock, and \$2.10 to \$2.15 from factory.

Blacksmiths' Upright Drill.—An illustrated description was given in *The Iron Age*, September 20, of the No. 5 Blacksmiths' Upright Drill, manufactured by Asa Goddard, Worcester, Mass. This Drill weighs 350 pounds, and is sold at the following prices, subject to a discount of 50 per cent. to the trade:

Not mounted.....	\$65
Mounted.....	68
Tight and Loose Pulleys, extra.....	4

Ice Creepers.—We give below the prices on the large and varied line of Ice Creepers manufactured by L. A. Sayre, Newark, N. J., whose advertisement illustrating the different patterns is given in this issue. Mr. Sayre has recently purchased all the interest of the Sinclair Scott Mfg. Company, Baltimore, Md., in the Ice Creepers they have previously manufactured, including stocks, tools and patterns. He has also purchased the Chicago Ice Creeper, with dies and tools for its manufacture,

from William W. Roberts of Philadelphia. The following are the prices on the varied line of Creepers which he is offering:

	Per dozen pairs.
Rival.....	\$1.75
Safety.....	1.75
Kennebec.....	2.00
Arctic.....	2.00
Security.....	1.25
Trusty.....	4.25
Jamestown.....	5.50
Hudson River.....	6.00
Instep.....	1.75
Eclipse (with tool).....	2.00
Chicago.....	7.50
North Pole.....	1.50

From the above prices a discount is made on gross orders of a kind.

Ash Sifter.—Streeter's Sensible Ash Sifter, an illustrated description of which is given in this issue, as manufactured by N. R. Streeter & Co., Groton, N. Y., New York office, W. H. Jacobus, 90 Chambers street, is sold at a list price of \$6 each, subject to a discount of 20 per cent.

Rat and Game Traps.—Streeter's Sensible Traps, manufactured by N. R. Streeter & Co., Groton, N. Y., New York office, W. H. Jacobus, 90 Chambers street, an illustration of which appears in this issue, are sold at a discount of 33½ per cent. from the following list:

No.	Gross.
20. Rat Trap.....	\$21.60
30. Game Trap, without chain.....	28.50
30. Game Trap, with chain.....	36.00

Protractor Miter.—This article was described in our issue, 1st inst., as put on the market by Sawyer Tool Company, Athol, Mass., for whom Peoli & Willey, 97 Chambers street, New York, are selling agents for domestic and export trade. The Miter is sold to the trade at \$2 each, subject to a discount of 25 per cent.

Boecher Darning Machine.—This device was illustrated in our issue, October 11, as put on the market by the Boecher Darning Machine Mfg. Company, 16 Avenue A, New York. The Darning Machine is sold to the trade at \$12 per dozen net.

Curry Combs.—New York Stamping Company, North Eleventh and Berry streets, Brooklyn, N. Y., in their new catalogue of Curry Combs announce that they have dissolved their connection with the American Curry Comb Company, and will be pleased to quote prices and terms on their full line of Curry Combs. They refer to the competition in Curry Combs as now so active that the profit of the manufacturer has been cut to a very small margin, and in view of this fact they have come to the conclusion that they can meet competition to better advantage and serve their customers in a more satisfactory manner by selling their Combs direct. They have added many new numbers to their list, the quality and novelty of which are alluded to.

Referring to the above matter, the American Curry Comb Company, under date of November 10, issue a circular

stating that it will not interfere, except temporarily, with their supplying to their customers the full lines of Combs which they have been selling them for the past three years. The Combs which have been furnished by the New York Stamping Company, except No. 44 self cleaning, will be made at their factories, and in a very few weeks they will be in position to ship promptly all orders for these patterns. Their numbers 000 and 314 have been enlarged and improved. A new catalogue is in course of preparation, and will be issued at an early date.

Glass.—Prices of Glass have not gained strength during the past week, though there is a noticeable improvement in demand. Additional factories are being put in operation and yet it is reported that stocks are not accumulating to any extent in manufacturers' hands. This would indicate that the production is being taken nearly as fast as the Glass is made. Quotations for large lots at factory are re-

ported as ranging from 88 per cent. to 90 and 10 per cent. discount. This is not to be understood as a price at which a few boxes can be bought, as a fair local price for small lots is from 85 to 85 and 15 per cent. discount for single strength, and from 85 and 15 to 85 and 20 per cent. discount for double strength Glass. While importers quote 70 per cent. discount on foreign Glass, there is little doubt but that lower prices have been made, when brought into competition with American Glass. Demand for Plate Glass appears to be falling, with weaker prices. While there is considerable variation in prices New York and New England average quotations are probably 70 and 10 per cent. discount on sizes 5 feet and over and 75 and 10 per cent. discount for sizes 5 feet and under on the Eastern list. Upon the same basis Western prices are 70 and 10 and 5 per cent. discount on sizes over 10 feet and 70 per cent. discount on sizes 10 feet and less from the Western manufacturers' list.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Net Prices.

Referring to the advisability of having goods sold at net prices, a Hardware house in Indiana refer to the matter in the following clear and concise terms:

Please add this firm as against net price quotations. Discounts are quicker and a safeguard against the consumer's gaining knowledge of prices.

Put It Under the Plow.

A correspondent, calling our attention to the following incident, explains that in Kentucky in the late election the official ballot contained at the head of each ticket an emblem to designate the party. Thus the Democratic ticket had a rooster at the top, the Republican an eagle, the Labor party a plow, the Prohibitionist a horse-shoe, &c. Ten years ago Mr. Avery, the president of B. F. Avery & Sons Plow Works, Louisville, was a candidate for mayor. With this explanation the following incident will be appreciated:

He was a remarkable looking old negro, and he had one of those kind faces which we sometimes see on the old slave time type of negroes which is passing away so fast. He had a kind and faithful heart, too, if we may judge from what he was saying to another negro as the Town Talker passed them on the street yesterday. They were talking about the election and the old man said: "Yas, suh, I voted fur Mistah Avery agin just lak I allus done since he run fur Mayor eight yeas ago. I just put de mark right under de plow, where it ud count fur Mr. Avery."

Local Syndicates for Purchase of Hardware.

The following communication with reference to the feasibility of forming local syndicates for the purchase of Hardware, and especially staple goods, has evidently been suggested by the recent reference to the Reading Hardware Association, and will be read with interest:

The joint purchase of goods as one of the objects intended to be accomplished by the Reading Hardware Exchange, the idea of which was hardly more than touched upon in your issue of October 18, 1894, suggests that local retail associations might follow up the plan to their advantage. There appears to be no reason why merchants in the same towns should not join together in the purchase of leading goods to be ordered by and shipped to one firm. This has been done with Nails and Wire, where two firms have been on friendly terms; and where a number of merchants have interests in common as in an association, the feeling of fraternity should be strong enough to overcome all petty jealousy among them. The question naturally suggests itself why other lines of season and leading goods should not be added to Nails and Wire with advantage, where it would make no difference if the makes or brands sold by the various merchants were the same. In some instances the same quality of goods are branded differently by the same manufacturer, or different styles of the same quality of goods could be chosen by the merchants ordering.

The idea of buying together is carried out by many wholesale houses in different parts of the country, by employing a syndicate buyer at some central point who combines the orders of

the jobbers for any line of goods which they want in common, and thus obtains special prices and freight rates, because of the quantity of goods bought and shipped. Similar advantages should accrue to the retail merchants of an association from ordering goods together.

As far as the writer knows this has not been one of the objects of any retail association, but it would undoubtedly be of great advantage to those who entered into such an arrangement. As most associations aim to reduce un-

reasonable and unprofitable competition, this would prevent the advantage gained in prices and freight being given to customers, and thus not only lost, but also induce the ruinous cutting of prices.

As incorporating the idea of buying goods with the other beneficial objects sought by retail associations may not have suggested itself to others, the writer feels that it would be of advantage to the trade in general if the matter could in some way be brought to their attention.

Bicycles for 1895.

In the following columns we give further information in regard to prices and patterns of wheels which will be put on the market by manufacturers during the coming season, with special reference to the Hardware trade, through whom Bicycles will evidently be marketed to a much larger extent than ever before.

THE PRICE for 1895 Bicycles has been quite definitely settled for the coming season, as many of the leading manufacturers have announced their determination to list their wheels at \$100. There are many exceptions, however, and some of the prominent makers will adhere to their 1894 lists, while other manufacturers will put their list price below \$100.

There is, however, an almost universal expression from manufacturers in regard to the quality of their machines, which indicates that there will be a general improvement in material, workmanship and finish all along the line.

It is a question, however, whether the Hardware trade are to be benefited by a reduction in the list price of Bicycles, and the following letter from GRAND RAPIDS CYCLE COMPANY, Grand Rapids, Mich., in which this phase of the subject is touched upon, will be read with interest by the trade:

We have been quoting our '95 net prices to the trade for some time. We do not believe that so much importance should be attached to the list price of wheels. This juggling with list prices by manufacturers is the worst thing they can indulge in. It tends to create a feeling of unrest and uncertainty with the retail trade. Everything depends upon what one or two large makers will do. These makers take particular delight in watching the results of their movements in this direction. They, also, realize the fact that, not only the Bicycle papers, but the press in general, are ready and willing to give them columns of free advertising, if they can but create a sensation by an extraordinary cut in list price or other move in this direction. Concerns who indulge in this "pastime" are not the kind of people that the Hardware trade wish to deal with. It has been customary for many years, in the Hardware business particularly, to let the list prices alone. The retail Hardware buyer is after net prices; that is what he wants. He wishes to enjoy the same freedom in conducting his business as the manufacturer enjoys in conducting his own. He wishes, also, to control his local list price, or selling price. To be constantly reducing list prices, with no increase in discounts, is greatly tending toward the point at which a manufacturer will be obliged to sell to the consumer, as dealers will not and cannot afford to sell an article like a Bicycle at 20 per cent. profit. The public at large are in possession

of the fact that discounts have been for several years past not over 25 per cent. and only 20 per cent. in many instances. A buyer expects to purchase his wheel at something off from the list price. If he is purchasing some of the well-known makes, he, of course, knows what the discount is, and he won't do a thing but buy that wheel at about 15 or 20 per cent. discount from list for cash, and the dealer has realized scarcely profit enough on the transaction to pay him for the transportation charges on the wheel. This is about where the low list prices and short discount manufacturers' trade find themselves at the end of a season or two. We shall not change our list prices from last year, neither will our net prices be reduced to any great extent. A very small reduction is possible, owing to a like reduction in cost of parts, tires, &c. We shall give our trade the benefit of this reduction, but we do not think it advisable to cut our list prices. We prefer to make it possible for our trade to get a good price for our goods. This could not be done with a low list price. We believe in a reasonably high list, and as low a net price as it is possible to sell goods at and take care of our trade properly without losses. We think an expression from the Hardware trade on this point would be highly interesting to the manufacturers.

The company advise us as follows regarding their prices and product for the coming season:

The wheel which we shall make our special leader for the 1895 trade will, as in 1894, be the \$100 Bicycle, but instead of being a medium grade wheel it will be strictly high grade in every detail, improved wherever we have found it possible, and made to compete in every way with any wheel on the market. We make it 4 or 5 pounds heavier than our light roadster, which will list at \$125.

The light roadster will be built to order only and will weigh from 19 to 22 pounds. We will have a new ladies' wheel as a companion to our No. 20, which will be sold at the same price—\$100. The latter weighs from 27 to 30 pounds. The frame is of the well-known Humber pattern. The wheels are 28-inch, and, where specially ordered, can furnish 26. Our No. 20 is built in five sizes, to accommodate the long and short riders. We expect to market our goods through the Hardware channels and sell direct to the dealers, with very few exceptions.

POPE MFG. COMPANY, Boston, make under date of November 1, in a letter to the trade, a second announcement in regard to their policy and plans for

the coming year, from which we give the following extracts:

All single Columbias, both road and track, will be listed at \$100, and we are earnestly devoting every resource of our establishment to the preparation of our line, which is to be the finest and the most advanced, and which will be calculated to meet the requirements of every buyer who is able to put \$100 into a Bicycle. They will be better than ever before.

As the next feature in our line we shall take the entire product of the Hartford Cycle Company, which concern, as you are aware, we started and have owned entirely from the outset. For 1895 they are to produce for us a man's and a lady's Hartford, of the same high class of workmanship for which they have already gained so good a reputation, but brought strictly up to date in all respects, and made most suitable companions to 1895 Columbias. While we cannot claim for them the same high value as for Columbias, we confidently assert that they will be equal in durability, lightness and in all the qualities which go to make up a high grade Bicycle to anything else on the market, except one or two of other makes. The price of the Hartfords we fix at \$80. Next, the Hartford Cycle Company will make for us a line to be known as the Wizard Bicycles, also up to date, fully equal to any that they have ever made before, and as good Bicycles as many manufacturers are putting on the market as high grade and at high grade list prices. The Wizard will list at \$60 for the man's and lady's, and \$50 for the boy's and girl's 26-inch machines.

From advices thus far received there appears to be no intention on the part of manufacturers to make any radical change in the style of wheels for 1895. The diamond style of frame has been so universally adopted by manufacturers and has been found so satisfactory that it is doubtful whether riders would consider any modification of the present form desirable. There will probably be some new features in the smaller details of the machines, such as narrower tread, two speed gears, new ways of adjustment, &c.

WESTERN WHEEL WORKS, 35 Barclay street, New York, with factory at Chicago, verify the statement in January last that their prices were made not for 1894 alone, but for years to come, and therefore that their output and price of Crescent wheels for 1895 will be as follows: Nos. 1 and 4 will be listed at \$75; Nos. 2 and 5 at \$50, and Nos. 3 and 6 at \$40. The company remark that they shall certainly improve their wheels in every way possible, with a view of giving the buyer as much for his money as they possibly can. The company state that their new line will be ready on January 1, 1895.

NATIONAL CYCLE MFG. COMPANY, Bay City, Mich., will continue the manufacture of the National for 1895, with improvements. The company state in a circular that the 1895 machine will be shown in ample time for the season's trade, and that it is a strictly high grade wheel in quality, finish and improvements.

GENDRON IRON WHEEL COMPANY, Toledo, Ohio, will have for the coming season their standard wheel, listed at \$100; a special wheel listing \$115; two

ladies' wheels, one listing at \$105 and the other at \$90, and two gentlemen's wheels at \$85 each. The company state that they have several contracts for wheels on their books and that their output will be about 33 $\frac{1}{3}$ per cent. more than for last year.

M. A. WOODBURY, Bradford, Pa., is offering Woodbury's Automatic Dry Chain Lubricator and Duster for the coming season; greatly improved, the manufacturer remarks. The device is designed to obviate dirty and hard running chains by properly lubricating and dusting them, while its weight, good work, appearance, durability, absence of rattle and price are points of excellence claimed for it by the manufacturer.

GLOBE CYCLE WORKS, Buffalo, N. Y., will have two distinct lines of wheels for the coming season—the Globe and the Mascot. The Globe is their leader, weighing 22 pounds and listing at \$100. A special racer, weighing 18 pounds, will list \$125. The Mascot weighs from 24 to 26 pounds and is listed at \$85. The company make convertible tandems, which can be changed, it is explained, into a single machine in from three to five minutes. They also manufacture a quadruplet for racing purposes. Attention is called to a crank hanger which is so arranged, it is stated, that by removing the left crank the whole bearing can be removed, cleaned and readjusted in a very short time.

HITCHCOCK MFG. COMPANY, Cortland, N. Y., advise us as follows in regard to their line for the coming season:

We are building two styles of gents' Bicycles, and two styles of ladies'. One we call the Cortland, which is a very high grade wheel. The frame is a regular diamond pattern high back. All parts of the wheel are made of the finest stock that can be procured and in the best workmanlike manner. The list price of this wheel is \$125. We build also a ladies' wheel in same grade and same price, called the Lady Cortland.

Our Silver King is also a high grade wheel, but not as highly finished as the Cortland, but with the same general construction and alignment of the frame. This wheel is listed at \$100. Our Silver Queen is made in same grade and same price.

We have also contracted with the Motor Cycle Company of Cleveland to manufacture and control the sale of their Motor Cycles; we expect to build them in large quantities. The quantity we shall build this season will somewhat depend upon the demand and sale for them. We expect, however, it will be quite large. Our output on Bicycles will be 10,000 or more aside from the Motor Cycle.

THE S. A. HAINES COMPANY, Indianapolis, Ind., advise us that the Eclipse Bicycle Company, whom they represent, have ceased to make any medium grade of wheels for 1895, and will put out high grade wheels only, as follows: Eclipse racer, weighing 18 $\frac{1}{2}$ pounds, listed at \$125; and the Eclipse Special, weighing 21 pounds, listing \$125. In addition to these they will make a ladies' road wheel and a gentleman's wheel, listing

at \$100. These, they state, will all be high grade goods; also that they are not seeking to be the largest manufacturers in the world, but that they do seek to make the best wheel that is made. The S. A. Haines Company, aside from the output of the Eclipse Bicycle Company, announce that they are prepared to furnish the jobbing trade with a full line of low priced medium grade wheels.

THE LEAGUE CYCLE COMPANY, Hartford, Conn., give the following outline of the League Chainless, Model 11, for 1895:

The length of steering head will be 11 inches, the depth of frame 24 inches and wheel base 44 inches. No. 20 and 22 gauge Shelby steel tubing will be used throughout, and swaged steel spokes of the Excelsior Needle Company's best manufacture will be used. The bearings throughout are to be of special design, made of tool steel; while $\frac{1}{4}$ -inch balls are to be used in the rear wheel, crank shaft and gear bearings, and $\frac{1}{8}$ -inch balls in the front wheel and steering head. The gears will be drop forged, and the teeth will be cut by special planing process. The width of tread will be 5 $\frac{1}{4}$ inches; the machine will be geared to 63 or 68, and the weight, with Simplicity 47 tires and wood rims, will be 25 $\frac{1}{2}$ pounds. Cycles will be built with three heights of frame, Model No. 10, measuring 22 inches from saddle post bracket to the crank shaft; Model No. 11, measuring 24 inches and Model No. 12, measuring 26 inches.

GEORGE N. PIERCE & Co., Buffalo, N. Y., refer to their line of wheels for the coming season as embodying such improvements in construction as to obviate the necessity of a complete line of tools and skilled mechanics in the repair shop. They also speak of changes in their wheels for 1895, as follows:

We recognize the fact that outside of large cities, where firms give exclusive attention to the Bicycle business, the Hardware trade is the proper party to introduce the wheels. Each season finds such great improvements made in the construction of the wheel that for the repair shop it is not necessary to have as complete a line of tools and as skilled mechanics to do the work as it has been absolutely necessary in the past. The construction of our wheels will be very simple, and almost any employee with a few simple tools can do any repair work that will be necessary on the wheels that we propose to send to the trade for '95. We have been since early summer constructing our '95 patterns, and are making an entire change in both our men's and boys', ladies' and misses' wheels, and shall furnish to the trade seven entirely new wheels. We started with the price in our mind before we began the wheels, and were governed accordingly.

THE EAGLE BICYCLE MFG. COMPANY, Torrington, Conn., have fixed the prices on their wheels ranging from \$115 to \$150, but state that they will place their agents in a position to compete favorably with anything on the market. The company outline their policy for the coming season in a pamphlet, as follows:

Our aim for 1895 is to build the lightest and most reliable line of Bicycles in the world. To accomplish this we have spared no expense to start right. Every feature in our new line for 1895 is new and a distinct depart-

ure. We have utilized no old parts or material. Each design is new, even to the smallest detail. Five distinct patterns, each of entirely new design, offer a wide range of choice. Specially constructed mounts for track racing and road racing, also for riders of more than average height, are prominent features. A feather weight ladies' machine, of new design and equipped not only with Eagle aluminum rims but with aluminum dress guards, mud guards, trimmings, &c., serves to complete the new line.

One of their models for 1895 is a machine weighing 17 pounds, and is, it is stated, very rigid. It has a narrow tread, detachable sprockets and is constructed of large size tubing.

Winchester Repeating Arms Company.

THE WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn., under date November 5,

issue a circular calling attention to the mutilation of some of their Guns apparently done for the purpose of concealing the number. The tangs, it appears, are taken from the Gun, softened, the numbers obliterated and the tangs rehardened, and in some instances the letters "W. R. A. Co." are placed upon that part of the Gun from which the number has been removed. As this cannot be done without injury to the Guns, the company urge that all parties handling or using Winchester Guns should take notice as to whether or not the number on the tang or frame is intact. They also advise that Guns the numbers of which have been obliterated or altered be not purchased, as they are undoubtedly second hand, refinished and wrongfully sold as new. The company state that they cannot warrant such guns.

Announcement has been made by Francis Bannerman, notifying the trade and the public that he has commenced suit against the New York agent of the Winchester Repeating Arms Company for infringement of certain letters patent. In regard to this matter the company advise us that they are confident that Mr. Bannerman has no claim on them, and they will defend the suit until it is settled. They also issue a circular to the trade stating that there is no infringement and guaranteeing to defend any user or seller against any loss occurring by reason of the alleged infringement, and agreeing to defend without expense to their customers any suit which may be brought in this matter.

AN ADVERTISEMENT in this issue illustrates the Clyde Draw Cut Pruning Shears manufactured by the Clyde Cutlery Company, Clyde, Ohio. The cutting blade is, we are advised, solid forged from the best shear steel, the finger blade or hook being solid forged from Norway iron laid with steel, the inside being ground to a bevel, thus insuring always, it is claimed, a sharp cutting edge. The link connecting the blade and hook is Norway iron, as are also the rivets, while the cap screw is steel. The handles are kiln dried hard maple, shellacked. The manufacturers state that every pair is unconditionally warranted. The Shears are made in two sizes, No. 1 having 25-inch handles and No. 2 (light weight) having 22-inch handles.

Alfred Field & Co.'s Catalogue.

ALFRED FIELD & CO., 93 Chambers street, New York, issue a catalogue containing 128 pages devoted to the German, English, French and American Hardware, Cutlery, Guns and Gun Material, Railroad and Mining Machinery, Tools, Chains, Anvils, &c., of which they are importers and dealers. The company are sole agents for Joseph Rogers & Sons, Sheffield, England, a full page view of whose works are illustrated. The company are also sole agents for Peugeot Frères, Coates Clipper Mfg. Company, Horse and Toilet Clippers; Eley Brothers, London, Caps, Wads, &c.; L. Hugoniot Tissot, fine French Plyers and other Small Tools; Isaac Greaves, Sheep and Garden Shears, &c.; W. K. & C. Peace, Grass Hooks, Scythes and Straw Knives; R. & J. Linacre, Grass Hooks, Sickles and Scythes, and for Webster & Horsfall, Steel Wire of all kinds. The catalogue is fully illustrated, showing Anvils, Vises, Cow Ties, Pliers, Nippers, Screw Plates, Dividers, Calipers, Spring Punches, Tinners' Snips, Gimlet Bits, Steel Letters and Figures, Cork Screws, Key Rings, Measuring Tapes, Trowels, Padlocks, Tracing Wheels, Sheep Shears, Pruning Shears, English Garden and Hedge Shears, Sickles, Butcher Knives, Table Knives and Forks, Carving Knives and Forks, Shears, Scissors, Razors, Hones, Razor Strops, Hair and Toilet Clippers, Dog Collars, Flobert Rifles, Rogers' Plated Ware, Pulley Blocks, Jack Screws, &c. An alphabetically arranged index adds value to the catalogue.

Want Price-Lists, Circulars, &c.

THE BEDFORD HARDWARE COMPANY have been organized and began business at Bedford City, Va., November 1, with R. H. Thomas, late with J. W. Thomas, as manager. The new firm advise us that they would be glad to receive copies of catalogues, price-lists, &c., issued by manufacturers in the Hardware, Tinware and House Furnishing Goods lines.

Whitman & Barnes Mfg. Company.

THE WHITMAN & BARNES MFG. COMPANY, 111 Chambers street, New York, have had their Columbian Exhibit, which later was shown in San Francisco at the Mid-Winter Fair, permanently installed in their New York warerooms. The case, which is of oak in antique finish, is in three divisions. The backs are covered with black broadcloth, and the goods of their manufacture highly finished, many of them polished and nicked, are artistically displayed. Of twist drills there are 375, arranged in the form of a scroll, which increases to a diameter of 5 feet. The drills, beginning with number 80, about the size of

a horse hair, are shown up to 1 inch in diameter, larger sizes being placed elsewhere. There are also Taper Sockets, Bit Stock Drills, Reamers, Screw Driver Bits, Bit Stock Countersinks, Milling Cutters, Riveted Flat Keys, Flat Spring Keys and Spring Cotters. Another board is devoted to Agricultural Implement parts, while the third section contains a line of Drop Forgings for Bicycles and other machines, Screw Drivers, Cold Chisels, Hammers, Wrenches, &c. The cases are approached through a swinging gate, which is part of a low railing of the same material and finish as the cases. The front show window has been fitted with a flooring high at the back and sloping forward. This will be upholstered with black cloth and covered with various other articles manufactured by this company at some of their numerous factories in the United States and Canada.

Local Associations of Hardwaremen.

THE OHIO HARDWARE ASSOCIATION, as mentioned in our last issue, is moving in the direction of the formation of local or county associations. To facilitate the formation of such organizations the following constitution and by-laws are suggested by it as indicating the lines on which they might be formed. This information may be of interest to Hardwaremen of other States, and perhaps aid in the formation of such local associations:

Constitution and By-Laws.

OFFICERS AND TERMS OF OFFICE.

The officers of the association shall be a president, vice-president, a secretary and a treasurer. The term of office shall be for one year, and the officers shall be elected on the first Tuesday in February of each year.

DUTIES OF PRESIDENT.

The president shall preside at all meetings. He shall appoint all committees and perform all the duties incident to the office of president.

DUTIES OF VICE-PRESIDENT.

The vice president shall preside instead of the president in his absence or inability to act.

DUTIES OF SECRETARY.

The secretary shall keep a correct record of all actions taken by the committees and when directed by the association or the committee he shall report same in writing to each member of the association. He shall keep a record of date on which information is given to members, and shall keep a copy book and copy each communication sent out, and perform any duty incumbent upon the office of secretary.

DUTIES OF TREASURER.

The treasurer shall have entire control of the finances of the association. He shall collect all dues and pay all bills, and perform any duties incident to the office of treasurer.

MEETINGS.

The regular meetings of the association shall be held on the first Tuesday of every month, unless changed by the president; but the president may call a meeting at any time without stating purpose and action to be taken, and any action taken at such meetings shall be legal and binding.

GOVERNMENT IN MEETINGS.

Parliamentary usage as laid down in Cushing's Manual shall govern this body in meetings.

REGULAR COMMITTEES.

The president may appoint a committee of three on prices. It shall be the duty of this committee to adjust all matters pertaining to prices of goods and any special matter that may be referred to them. He may also appoint a committee on railroad rates, &c. The committee shall take action on matters relating to railroads, such as overcharges, demurrage, &c., where such matters are brought before the association for action, and such other matters as may be referred to them. Also a committee of three on credits and finances. This committee shall have charge of all matters pertaining to giving and taking away credits, reporting on past due accounts unpaid, bad debts, &c., and such other matters as may be referred to them from time to time.

Also a committee of three on legislation. This committee shall keep posted on the laws directly affecting the Hardware trade, and where in their judgment any good effect can be brought about in any way, the same shall be reported to the association for action.

ALL ACTION BINDING.

Every member of the association shall be bound by the action of the association and the committees on any matter referred to them.

TERMS OF STANDING COMMITTEES.

All committees shall serve for six months, but the same committees may be reappointed at the option of the president.

DUES.

The dues of each member shall be \$2, payable quarterly, in advance.

ASSESSMENTS.

The association may at any time assess the members by a two thirds vote of the entire membership.

ELIGIBILITY.

Any Hardware firm in good standing, doing business in the county, is eligible to membership, and all members of firms are entitled to attend meetings of the association; but each firm will be entitled to one vote only.

This constitution may be amended at any meeting by a two-thirds vote of the entire membership.

E. C. Atkins & Co.'s Catalogue.

E. C. ATKINS & CO., Indianapolis, Ind., issue a catalogue containing illustrations and revised lists of goods manufactured by them, superseding all previous lists. Special attention is called to their new line of Hand, Panel, Rip and other small Saws which they are now producing. These goods are made in two grades. The quality of their Silver Steel Hand Saws is especially referred to. Their Columbian Moss Back Cross Cut Saw is also spoken of as embodying all of the improvements in Cross Cut Saws. The catalogue, with these recent additions, illustrates a very complete line, including Adjustable Tooth Circular Saws, Inserted Tooth Saws, Solid Tooth Circular Saws, Band, Mulay, Mill, Gang and Dray Saws, Pit and Ice Saws, Cross Cut Saws, Wood Saws, Saw Tools, Hand, Panel and Rip Saws, Butcher, Pruning and Compass Saws, Corn Knives, Trowels, Saw Makers' Tools, Saw Mill Dogs, Slaw and Kraut Cutters, &c.

Yale & Towne Mfg. Company.

YALE & TOWNE MFG. COMPANY, Stamford, Conn., announce that on and after November 19 the general offices of the company will be located on the second floor of the Stewart Building, corner Broadway and Chambers street, New York, in the center of the Hardware district. Announcement is also made that at a recent meeting of the directors William F. Donovan, the present general manager of the company, was elected to the position of vice-president. The management of the new general offices in New York will be under the immediate direction of the vice-president, who will have his headquarters there. The New York branch house and salesroom, under charge of Assistant Treasurer Thomas F. Keating, will be continued in all respects as heretofore. The company's other branch houses and salesrooms in Chicago, Philadelphia, Boston, Pittsburgh and San Francisco will also be continued without change, and will each constitute the point of distribution and correspondence for the business within its territory. The direction of the manufacturing and financial affairs of the company, including the management of their plants at Stamford and Branford, will continue to be conducted from the executive offices in Stamford.

Trade Items.

THE WM. SCHOLHORN COMPANY, New Haven, Conn., having discontinued the sale of their goods through Julius Berbecker & Co. of New York City, will now ship and bill all their goods direct from factory, where all correspondence and orders should be addressed.

IN THEIR ADVERTISEMENT in this issue Atlas Mfg. Company, New Haven, Conn., for whom W. H. Jacobus, 90 Chambers street, New York, is agent, call attention to the Bradley Shelf Brackets and allude to the exceptionally light weight of this Bracket. It is also stated that it will allow any competing Bracket an excess of 100 per cent. in the metal used in its construction and will then support 20 per cent. more weight. The company suggest that those purchasing the Bracket be sure to get new goods.

THE DAVIS & STEVENS MFG. COMPANY, Seneca Falls, N. Y., are taking energetic measures to restore their works, which were destroyed by fire early in October. Their plant was completely equipped for the manufacture of plumbers' specialties in brass, leather and rubber. They have already ordered new tools, stock, &c., and have secured temporary quarters where they will at once execute all unfilled orders. They make an exceptionally complete line of Pumps for inflating pneumatic tires, a number of patterns of varied capacity and expense being offered to the trade. They also direct special attention to their Pump Leathers, of which they are large manufacturers.

DURING THE BANQUET at the Quincy House recently tendered by the Putnam Nail Company to the members of the National Master Horseshoers' Protective Association who were in attendance at the third annual convention in Boston, W. W. Whitmarsh, the treasurer of the company, who acted as toastmaster at the banquet, was the recipient of a beautiful watch chain and seal, which was presented to him

on behalf of the association by President Buckley. The watch chain and seal are of massive gold, and upon the seal is set in full relief a horse's head peering through a horseshoe. This horseshoe is decorated with diamonds to represent the Nails. On the afternoon of the same day, during a visit of the members of the association to the company's plant at Neponset, Mr. Whitmarsh was presented with a gold headed cane by the company's employees. The cane is a handsome one and bears the following inscription: "Presented to W. W. Whitmarsh by Nail Makers' Union No. 6313, A. F. L."

EDWARD PETERSON, who has for years conducted a large Hardware store at 4956 and 4958 Wentworth avenue, Chicago, will open a second store at 4925 Cottage Grove avenue, about Christmas. He is now completing the building and proposes to fit up the new store with the most improved appliances and in the most attractive manner.

ENTERPRISE IN ADVERTISING is shown by W. H. Briggs & Son, Valdosta, Ga., by a full page advertisement in a local paper, in which illustrations are given of a number of seasonable goods. Among these is a line of Turpentine Supplies, of which Driver Hacks, Pullers, Single and Double Edge Scrapers, Shove-Downs, &c., are manufactured by the firm.

THE W. BINGHAM COMPANY, Cleveland, Ohio, in a recent circular from "the Corner Desk" call attention to William Jessop & Sons' Steel, and give pictures of the founder, the late chairman of the company, the present chairman, also a view of the works. The circular refers to the business as having been a modest one as started by William Jessop a century ago, but as having grown until it now requires a plant occupying 30 acres of land to turn out the immense quantity of Steel the trade demands for general purposes, besides two smaller works (the Park and Soho Works) employed exclusively in making Steel for pens. Their large plant, the Brightside Steel Works, is used for making every grade of high class steel, from that used in watch spring to the enormous stern plates and rudder posts for ocean liners. It is stated that the W. Bingham Company have handled Jessop's steel since 1846—for 48 years—and it forms one of their principal lines of import, that they get it direct from Sheffield in large lots and that their assortment of sizes is always complete.

McKEESPORT SUPPLY COMPANY, McKeesport, Pa., manufacturers of and jobbers in Ferrotypes Plates, Japanned Signs, Developing Trays, Panels, &c., Plumbers' and Gas Fitters' Supplies, Fenders and Coal Vases of iron and brass and Aluminum Wares, issue a circular under date of November 1, in which they announce that they have become an incorporated company, with George Russell, president; Wm. A. Cornelius, vice-president; Theo. Tonnele, treasurer, and Theo. M. Hopke, secretary. They state that they have enlarged their manufacturing facilities, and promise the best workmanship and prompt attention to all orders placed with them. In addition to their usual line of goods they are prepared to undertake the manufacture of novelties and specialties in japanned or pressed ware, also small castings for ornamental purposes, &c.

WIEBUSCH & HILGER, 84-86 Chambers street, New York, have recently been appointed sole agents for the Acme Pliers, made by the Higginum Hardware Company, Higginum, Conn. The features of these Pliers are that the cutters are interchangeable, drop

forged from tool steel and fitted with a screw bolt so they can be easily taken apart. They are made in 4½, 6, 8 and 10 inch sizes, cutting Nos. 14, 11, 8 and 6 wire respectively.

Price-Lists, Circulars, &c.

THE LUNKENHEIMER COMPANY, Cincinnati, Ohio: Brass and Iron Valves, Lubricators and Steam Specialties. An 1895 illustrated catalogue and price-list shows an extensive line of these goods, of which descriptions are also given. The company state that their efforts are constantly directed to keeping the quality and efficiency of their productions at the highest standard of excellence; that they use only the best materials, maintain a rigid system of inspection in the production of every article, and subject them to tests before shipment.

THE H. P. NAIL COMPANY, Cleveland, Ohio: Wire Nails, Wire Rods, Wire, Staples, Tacks and Rivets. The catalogue while convenient in size is admirably arranged, being divided into departments under which each line of goods is treated, information regarding which is made easily accessible by a department arranged index. Lists are given with illustrations of Common Wire Nails, Miscellaneous Wire Nails, Spikes, Hinge Nails, Dowel Pins, Chaplet Pins, Chaplets, &c., Rivets, Columbia Tacks, Double Pointed Tacks and Staples and Wire. It is an exceptionally complete and comprehensive list.

NEW YORK STAMPING COMPANY, Brooklyn, N. Y.: Curry Combs. A handsomely printed catalogue illustrates Lawrence Perfect, Improved Eclipse and the Edgar Curry Combs, each in a large variety of styles and sizes. The company state that they have dissolved their connection with the American Curry Comb Company, and are in a position to quote prices and terms on their full line of Curry Combs, as illustrated in the catalogue.

INTERIOR TELEPHONE COMPANY, 203 Broadway, New York: The Colvin Interior Telephone System. The system is designed for intercommunication between the several departments in public buildings, hotels, business offices, stores, factories, steamships, warehouses, private dwellings, &c. A catalogue contains illustrations, descriptions and testimonials relating to the system.

THE AUTOMATIC BANK PUNCH COMPANY, 83 Washington street, Brooklyn, N. Y.: Automatic Bank Punch. The Punch is for cutting figures entirely out of checks, for cutting the number of shares in stock certificates and the cancellation of papers of all kinds. The office has recently been located at the factory in Brooklyn and both the plant and the selling facilities are being enlarged with gratifying results.

C. W. DUNLAP & Co., 88 Chambers street, New York: Housekeeping Hardware and Garden Tools. An illustrated price-list shows Mincing Knives, Cleavers, Steak Pounders, Cake and Fish Turners, Forks, Skewers, Knives, Saws, Tack Claws and Hammers, Carpet Stretchers, Slicers, Can Openers, Ice Picks and Awls, Ice Hatchets and Tongs, Lemon Squeezers, and various other goods of like character. Attention is called to an improved Socket Ice Chisel, with both short and long handles. The blades are made of crucible cast steel, with four teeth, and are riveted to a malleable socket, those with extra long handles being 21 inches over all. An improved Mincing Knife, shown has a high, broad blade of crucible cast steel 6

inches wide at the bottom, with sides beveling to a width of 3 inches, at a distance of $3\frac{3}{4}$ inches from the bottom. This extra height is to prevent meat, when chopping, from being thrown out of the bowl. The blades are securely riveted to polished malleable iron shanks, which pass through hardwood handles and are then riveted with a burr. The blades are tempered in oil.

APPLETON MFG. COMPANY, Philadelphia, Pa.: Challenge Family Grinder and Polisher. An illustrated circular shows the Grinder in use attached to a sewing machine; also a few of the articles which the machine will grind.

THE CINCINNATI TOOL COMPANY, Cincinnati, Ohio: Mechanics' Tools and Letter Copying Presses. Two illustrated catalogues and price lists are devoted to these goods, the first showing Spoke Shaves, Washer Cutters, Hollow Augers, Screw Drivers, Adjustable Clamps, Bicycle Wrenches, Twist Drills, combination Drawer, Pad and Night Locks, &c. The other catalogue, besides showing a line of Letter Copying Presses, illustrates their Perfection Roller Blotter Bath.

W. S. HAMMOND, Lewisberry, Pa.: Window Sash Springs. The manufacturer sends an 1895 calendar, calling attention to Hammond's Window Sash Springs which are designed to support sashes when open and to lock them when closed.

BISSELL CARPET SWEEPER COMPANY, Grand Rapids, Mich.: Carpet Sweepers. The company are sending out tasty advertising matter relating to Carpet Sweepers for Christmas presents. Suggestions are made to merchants as to the best manner of making a success of these goods for the holiday trade, including window cards printed in colors, furnished by the manufacturers; also of a list of articles suitable for presents to be printed by them on the booklets furnished merchants.

THE AMERICAN SPECIALTY COMPANY, Hartford, Conn.: Black Hawk Nail Puller. A circular illustrating the Puller states that it has a powerful leverage and a strong grip; that it is simple in construction; that it will not batter, and that the jaws are made of fine steel, drop forged and hard tempered by a new process.

LEONARD CLEANABLE REFRIGERATORS: The Grand Rapids Refrigerator Company of Grand Rapids, Mich., issue a unique and exceedingly fine catalogue of these Refrigerators. It consists of a large number of photo engravings, printed in fine paper in loose sheets, which are held together at one corner by a blue ribbon tastefully tied. A blue cover, with white lettering, is placed on the front and back, and the engravings are printed in blue. The arrangement is sure to attract attention, apart from the character of the goods shown, which are of the high standard in design and finish that has always been characteristic of this company. The variety of styles presented is very great, covering standard patterns and special shapes for special requirements. The line of Sideboard Refrigerators shown is unusually large and covers some decidedly new features. The sideboard finish has been given to some small Refrigerators, thus enabling those who do not need a large cooling apparatus to get one artistically finished if they desire it. Some of the Refrigerators are made with a china cupboard over them, and are thus specially desirable in rooms in which economy of space is a desideratum. All these Refrigerators are made of hardwood, either of ash or oak, and finished in

antique. The trimmings are solid bronze and the carvings are cut in the solid wood, instead of being merely embossed. Three medals of highest excellence and a special diploma were awarded these goods at the World's Fair, Chicago, in 1893, also the gold medal at the Antwerp exhibition in 1894.

COBB & DREW, Plymouth, Mass.: Iron, Brass and Copper Rivets, Nails, Tacks, Staples, small Washers and Riveting Burrs. Under date November 1 the manufacturers send the revised list of Rivets and Burrs.

I. P. FRINK, 551 Pearl street, New York: Frink's Improved Reflectors for gas, electric, kerosene or daylight. An 1895 catalogue illustrates Glass Reflecting Chandeliers for electric light, special Reflecting Fixtures for drawing and music rooms, art galleries, &c.; Reflectors for street cars and small rooms with electric lights; Gas Chandeliers, Oil Chandeliers, Fixtures for Stage Lighting for theaters, halls, assembly rooms, &c.; Daylight Reflectors, Gas Fixtures, Hall Lamps, Pulpit Hoods, &c. The concern state that for 37 consecutive years they have made church and public lighting a specialty.

GRAFTON STONE COMPANY, Grafton, Ohio: Grindstones for all purposes. The company issue a catalogue containing a number of full page views of the manufacture of grindstones in their various quarries. The company have recently added a family Grindstone and Scythe Stone plant to their business, and are now in position, they state, to furnish these to customers in any quantity. A portion of the catalogue is devoted to illustrations and prices of Mounted Grindstones, Family Grindstones and Scythe Stones, these being followed by six tables giving weights of Grindstones from 2 to 8 feet in diameter and from 2 to 16 inches in thickness.

H. L. JUDD & Co., 87-89 Chambers street, New York: Metallic Bedsteads, Cots and Bassinets. Catalogue No. 27, devoted to this department of the business, illustrates a large and varied assortment of Bedsteads of all sizes and styles in brass burnished and iron enameled finishes, while special finishes are made to order. In this connection the company also illustrate Wire and Upholstered Springs, Hair and Feather Beds, Mattresses, Bolsters, Pillows, &c.

BALDWIN REFRIGERATOR COMPANY, Burlington, Vt.: The Baldwin Refrigerator. The company issue a fully illustrated catalogue of these goods, showing them in a large variety of styles and finishes. The line includes 70 metal lined and 40 spruce lined Refrigerators, designed for family use, for hotels, clubs, restaurants, butchers, grocers, florists, hospitals and other public institutions. The goods are of both hard and soft wood, while many of the larger style standard goods formerly made of soft wood are now built, it is stated, of ash, antique finish, without advance in price. Many new styles of Refrigerators have been added, and all styles, it is remarked, have been much improved in trim and general finish. All goods are provided with the company's lever wedge lock, and with a new waste trap. To supply the demand for their goods the company now run their factory all the year round.

GENEVA TOOL COMPANY, Geneva, Ohio: Hand Farming Tools. An illustrated catalogue for 1894-95 shows Hay, Straw, Manure and Spading Forks, Garden, Mortar, Planters', Cotton and Weeding Hoes, Cast Steel and Malleable Garden Rakes, Potato

and Manure Hooks, Snaths, Handles, Cultivators and Wing Shovel Plows, Revolving Horse Hay Rakes, &c. The company have added several articles not included in previous lists and have added new machinery to their works.

B. F. AVERY & SONS, Louisville, Ky.: Cast, Steel and Chilled Plows, Planters, Harrows, Cultivators, &c. The sixty-ninth annual catalogue of the firm calls attention to the above line of Plows; also to Riding and Walking Cultivators, Middle Bursters, Sulky and Gang Plows, Louisville Double Edge Stack Cutters, Patent U Steel Trees and Neck Yokes and Moon Patent Rolling Colters.

It Is Reported—

Alabama.

That Park Johnson & Co., SELMA, have dissolved.

Illinois.

That Benjamin Broughton and Frank Taylor of DE KALB are negotiating for the purchase of a Hardware stock at LAKE VIEW, IOWA.

Indiana.

That an accumulation of natural gas under the floor of James Galbreath's Hardware store, at SWAZEL, caused an explosion early on the morning of the 8th inst., that blew the front part of the building into the street.

That E. Sell of KENTLAND has sold his Hardware store at that point to Hugh Gainer of RAUB.

That J. F. McNear, Hardware merchant, COLUMBIA CITY, has gone out of business.

Iowa.

That County Auditor C. M. Dorse has purchased the H. J. Winkie Hardware stock, at ALGOMA.

That F. J. & W. M. Anderson of Mitchell County have purchased the Hardware stock of Davis & Zimmerman, JEFFERSON.

That W. C. Gerner, Hardware and Implements, BARNHAM, has sold out to P. M. Jenks.

That Wilson & Nelson, WIRT, dealers in Hardware and lumber, have sold out.

That Hill & Haskett, Hardware dealers at EARLHAM, have sold out to W. M. Clark & Co., who have decided to add a line of furniture to their business.

Kansas.

That Mr. Brill of WAMEGO has purchased W. H. Wood's Hardware stock, at NORTH TOPEKA.

Louisiana.

That the Southern Hardware Company, MONROE, have been incorporated, with I. Baer as president and S. Marx as secretary and treasurer. The capital stock is \$10,000.

Maine.

That Charles H. Clark, in the Hardware business at KENNEBUNK, has sold out to John W. Lord & Co.

Massachusetts.

That the Peirson Hardware Company, PITTSFIELD, are making extensive improvements in their store.

That W. W. Lydston, MERRIMAC, has been succeeded by the Amesbury Hardware Company.

Michigan.

That Hull & Co. have bought the Hardware stock of R. J. Clark, at PORT HURON.

Minnesota.

That W. H. L. Donaldson of PRESTON has sold his Hardware stock to Kinsella & Rockwell of PLAINVIEW, Wabash County.

That Thomas Hall will soon open a new Hardware store at ST. CLAIR.

That Weinberg & Hagen have purchased the Hardware store of Nels Mikkelsen, at NEW LONDON.

That Hoppin Hardware Company, DEXTER, are building an addition to the rear of their store 20 x 40 feet.

That Smith & Viesselman, FAIRMONT, have purchased ground on which they will erect next spring a two story brick structure to accommodate their growing Hardware business.

That R. Rierson & Co., Hardware and Implements, LYLE are making preparations to build a corrugated iron warehouse in the rear of their store building.

Missouri.

That Chas. Morelock has bought out the business of Morelock & Son, KIRKSVILLE.

That W. R. Clark has purchased Mr. Lansche's interest in the Hardware firm of J. P. Lansche & Co., TROY. The business will hereafter be conducted under the style of Wright & Clark.

That Davis & Morrow, FAIRFAX, have disposed of their business.

That the LUDLOW Hardware firm of Phillips & Haley have disposed of their stock.

Nebraska.

That the firm of J. H. Stewart & Co., BLAIR, have been dissolved, E. A. Stewart retiring. The business will be continued by J. H. Stewart under his own name. This is the oldest Hardware house in BLAIR, having been established in 1869. In the early 70's J. H. Stewart began his apprenticeship in the business and early became a partner, and for many years past has been its managing head.

New Jersey.

That G. A. Myers & Co., wholesale and retail Hardware, PATERSON, have dissolved. George Christie succeeds.

New York.

That the store house of George Barr, Hardware merchant, OGDENSBURG, was destroyed by fire on the 4th inst. Loss, \$10,000.

That Thomas H. Parker, dealer in Stoves, BINGHAMTON, has sold out.

Ohio.

That W. A. Fillmore, Hardware merchant, ZANESVILLE, has removed to new quarters.

Pennsylvania.

That thieves broke into the large show window of Eugene De Turk's Hardware store, at KUTZTOWN, on the 6th inst., and carried off Firearms to the value of \$200. The thieves in order to deaden the sound of the falling glass placed a mattress in front of the window.

That Foote & Shear, Hardware, Stoves, &c., 513 Lackawanna avenue, SCRANTON, are removing to new quarters on Washington avenue, with about 18,000 feet of floor space.

South Dakota.

That J. A. Gilchrist is closing out his Hardware stock at WATERTOWN.

That D. H. Wood has purchased the Hardware stock of F. B. Phillips, at ALPENA.

Tennessee.

That G. S. Close, formerly of Close & Teag, CHATTANOOGA, has bought the Hardware stock of John Wyatt, on Montgomery avenue.

Texas.

That burglars broke into the Hardware store of G. W. Hacker, WOLFE CITY, on the 5th inst. and got away with about \$100 worth of Guns, Pistols, Razors, &c.

Virginia.

That the Bedford Hardware Company, R. H. Thomas, manager, have opened a new store at BEDFORD CITY.

Washington.

That the store of the Davis Hardware Company, MOUNT VERNON, was entered by burglars on October 27, who secured a number of Shot Guns and Pocket Knives.

Wisconsin.

That the Hardware store of Sherman Peters, at MUSCODA, was burglarized on October 29. Cash to the amount of \$150 was secured, besides a few notes and mortgages.

That Bernard Notting, dealer in Hardware, &c., PORT WASHINGTON, has sold out.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—Efforts have been made to more closely harmonize the interests of corrodors. Those efforts have, in one way and another, caused the statement to appear in print that some agreement has been arranged between the National Lead Company and outside corrodors. There may be an agreement, but it is doubtless elastic. In any event prime quality dry White Lead may still be secured at 4¢, as against the combine inside quotation of 4¼¢, while so-called inferior sorts are on the market at 3¾¢. The low prices have failed to stimulate business in this vicinity, and that, in connection with the cheapness of crude material, is suggestive of a rather weak market. Lead in Oil has fared no better. Domestic has been sold as low as 5¢ for the Oil (package extra), and 5½¢ @ 5½¢ regular. Foreign, in round lots, has been quoted at 5½¢ @ 5¾¢, and bids were solicited of 5½¢, indicating a rather weak market.

Red Lead.—No change in this line has taken place. Prices for both domestic and foreign brands remain about as they were a week ago, and little more than routine business has taken place. The offering, however, indicates that the undertone of the market is rather weak.

Litharge.—Requests for deliveries of low grade product have been quite numerous, but they were freely met. It is about the best that can be said of the market. Dealings otherwise have been commonplace in the extreme and prices have not changed for the better. It was intimated that bids of 4¢ net for low grade, and 5¼¢ net for grinders' stock, in large lots, would be accepted. Outright offers at within ¼¢ of those figures were, however, strictly the exception.

Orange Mineral.—The market is specked with irregularities of one sort or other, but no radical changes in prices take place and business proceeds in about the usual way. The periodical story of enhanced cost in the foreign is going the rounds, but it is so familiar that it has no effect.

Zincs.—About the ordinary business for this season of the year is passing in American Oxide. Prices are not exactly parallel, but they show no important change. Foreign brands are moving at about former prices but in a very moderate way only.

Colors, &c.—There is not a new feature in the market for either Dry or Oil Colors and the Mixed Paint market is quite as bare. It is almost wholly a case of merely routine business at steady prices.

Oils and Turpentine.

Linseed Oil.—The market is at present very firm. Outside lots cannot be

secured at the special prices that were made a short time ago, and the leading producers here and in the West offer very indifferently. Except in routine way little business has been done, but the demand has improved in some degree, incidentally adding to the tone of the market. The cost of raw material would seem to justify present prices for Oil, but there are some signs that the market is helped by harmony among crushers.

Cotton Seed Oil.—Large home consumers have purchased quite freely. Exporters have manifested rather more interest also. Between the two influences the market has gained somewhat in tone, but the actual movement in prices is comparatively moderate. Late business was chiefly on the basis of 24¢ for prime crude and 28½¢ @ 29¢ for prime Summer Yellow.

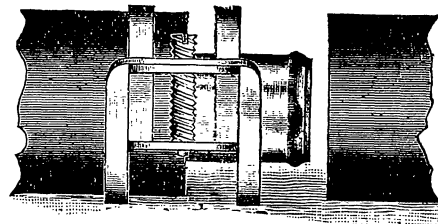
Lard Oil.—Prices dropped to the basis of 54¢ @ 55¢ for prime city brands, but the lower rates served to stimulate business more or less, and the market has since shown firmer tone. At present the demand is fair.

Fish Oils.—No dealings of importance in crude Menhaden, Sperm or Whale Oils have taken place, and the condition of the market is unchanged. Manufactured products are selling in a jobbing way to about the usual extent, and chiefly at steady prices.

Spirits Turpentine.—A very quiet market has been experienced, and the demand at present is conservative in the extreme. Selling pressure is not great, however, despite the slow demand. Prices are held quite steady at about 28½¢ for regular and 29¢ for machine barrels.

Double Clinch Hose Band and Mender.

Clayton & Lambert Mfg. Company, Ypsilanti, Mich., are offering the hose band and mender illustrated in the accompanying cut. It consists of a mender tube of seamless brass, which is placed inside the hose, and a double metallic band with a brass set screw.



Double Clinch Hose Band and Mender.

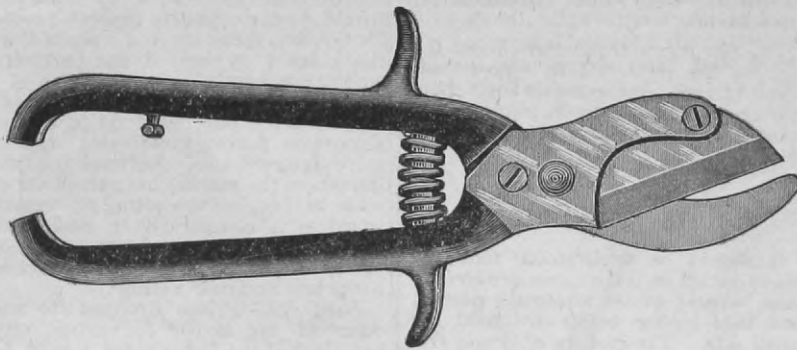
One band and one tube is required for mending a hose. It is explained that the brass tube is easily inserted, giving a full opening for the water to flow through, and that it does not rust. The screw is attached to the band so as not to become detached, and the band can be removed and replaced as many times as desired. The screw, it is stated, is never set by rust, and that it is never detached or lost. It is pointed out that the owner can mend his own hose, and that a knife and screw driver are the only tools required for the operation. The manufacturers claim that the mender is water tight, durable, light, strong and easily put on, and that it may also be satisfactorily used for attaching couplings, nozzles and other hose fixtures. The menders and bands are made in ½, ¾, 1, 1½ and 1¾ inch sizes. A sample and prices will be sent free by the manufacturers to inquirers.

Cronk's Pruning Shears.

Cronk Hanger Company, Elmira, N. Y., are offering pruning shears as here shown. The shears have a solid steel blade and malleable handles. The man-

tractively finished. The manufacturers state that the scoop has an absolutely safe edge, and that it may be used by grocers and shippers for handling apples, pears, oranges, peaches, &c., without danger of bruising or injuring the fruit. The scoop is recom-

refined steel, well tempered. It is explained that the grater and cutter is easily cleaned in a few minutes, and that it is simple and durable. The ma-

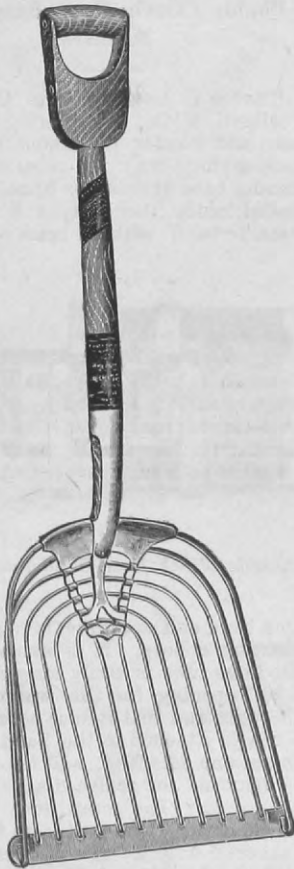


Cronk's Pruning Shears.

ufacturers state that the shears, being made with a straight blade, are drawn cut, that they will do the work easily, and that their cost is low considering the quality.

Improved Wire Scoop.

The cut here shown represents a scoop manufactured by the Cleveland Lock Company, Cleveland, Ohio. It



Improved Wire Scoop.

is explained that the scoop is of unusually large size; that it has a socket in which the handle fits; that it is made entirely without rivets, of spring steel stock, making a light, rigid and strong tool; that it is finely galvanized and at-

mended by the makers for use by fish dealers to handle fish rapidly; and when provided with a long D handle for ice men, for removing slush ice when gathering the ice crop.

The Rochester Vine Holder.

Rochester Radiator Company, Rochester, N. Y., are offering the vine holder shown in the accompanying cut. The holder is made of 14-gauge galvanized wire, and in use the small hook is snapped on the trellis wire and remains there permanently. The cane is sprung into the lower or larger hook back of a bud or branch. This holds the cane securely, and is referred to as not cutting or injuring it, as the hook springs



The Rochester Vine Holder.

with the growth of the vine. It is also stated that the hook will hold either a vertical or horizontal cane securely. The point is made that the vine holder once placed on the trellis remains there, and can be used season after season, becoming a permanent investment and adding to the value of the plant. It is claimed that the time and labor saved by the use of the holder in one season will more than pay the first cost.

Perk's Combination Horseradish Grater and Cutter.

The accompanying cuts represent a horseradish grater and cutter put on the market by Schroeter Brothers, 811 North Fourth street, St. Louis, Mo. The makers state that the best quality of iron and steel is used in its manufacture, and that the knives are made from



Fig. 1.—Perk's Combination Horseradish Grater and Cutter.

chine is especially recommended for grating horseradish, but is also adapted for grating and slicing raw and cooked potatoes, beans, bread, almonds, choco-



Fig. 2.—Reverse Side of Grater and Cutter.

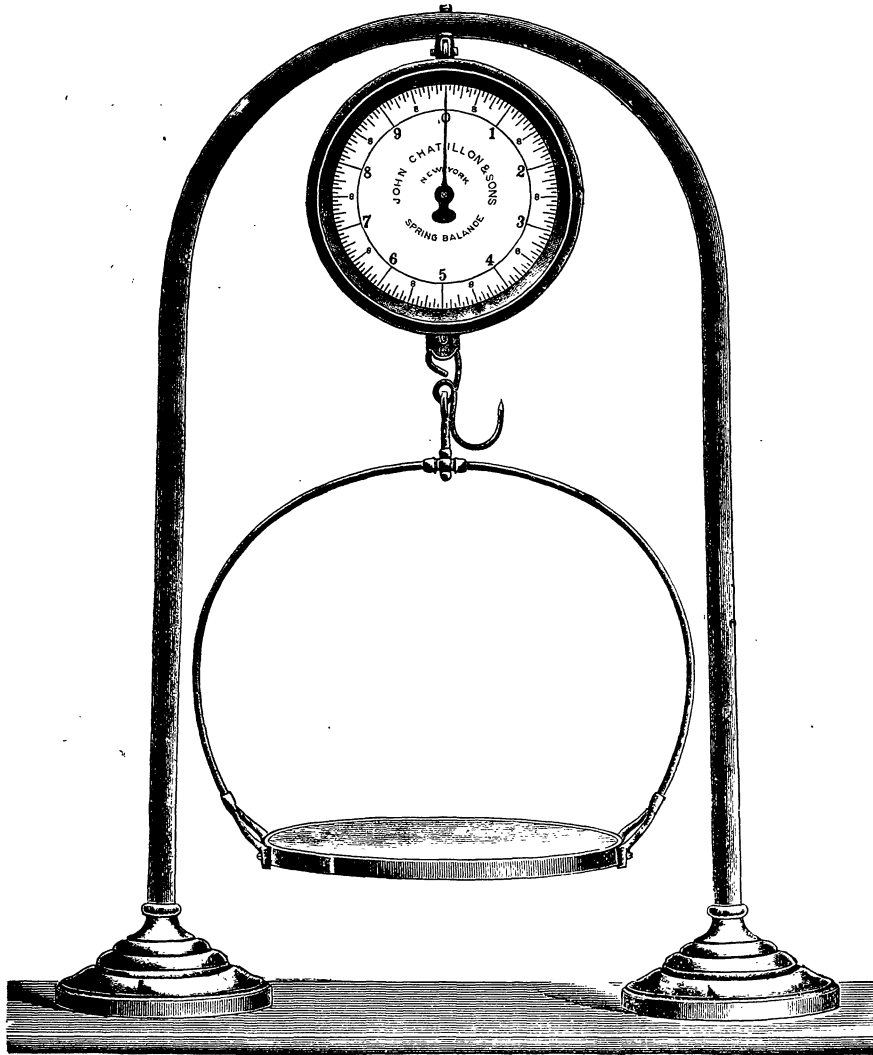
late, cheese, crackers, cocoanut, &c., and other articles. The machine is designed for household and hotel use.

THE SAMUEL WINSLOW SKATE MFG. COMPANY, Worcester, Mass., are sending out an exceptionally artistic and attractive colored lithograph representing a skating scene. In the foreground are two ladies on skates with which they have cut the name of the company on the ice. The background is pine woods and snow, the whole being finely executed. The picture is worthy of a handsome frame and those who receive it will find it advantageous to give it a prominent position where customers will be attracted by it.

Spring Balance Frame.

John Chattillon & Sons, 85-93 Cliff street, New York, have designed a spring balance frame, as here shown, in which to suspend large dial balances, with hook and pan. The frame is made of brass tubing, supported by large circular standards of the same metal, all of which is polished and nickeled. The article has been brought

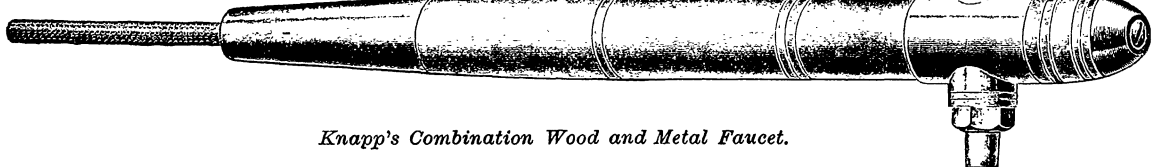
described as being made of hard maple, as impervious to any liquor, as tested under a pressure of 80 pounds before being sent out, as being nickel plated, polished and varnished, and as being equipped with an automatic strainer. The part of the faucet that enters the barrel is protected by a metal ferrule and tubular screw, while the head is protected by a malleable iron cap. A solid steel band strengthens the key way, and the key is ground in a metal



Nickel Brass Balance Frames.

out to meet a demand from fine shops for something of this character to stand on the counter. There are two sizes, Nos. 1 and 2, suited to all kinds of 15, 30 and 60 pound hanging balances. In No. 1 can be hung all regular large

bushing to form a permanently tight and easily working joint. The key is wood lined to prevent corrosion, and is so constructed as to throw the stream to a point. It is explained that the automatic strainer is a perforated tin



Knapp's Combination Wood and Metal Faucet.

dial balances with pans of ordinary size. No. 2 is intended for balances having extra large dials and pans.

Knapp's Combination Wood and Metal Faucet.

The accompanying cut illustrates a combination wood and metal faucet put on the market by Knapp's Faucet Company, Syracuse, N. Y. The faucet is

tube, which slides back into the bore of the faucet and releases itself automatically after the barrel is tapped. The manufacturers remark that the faucet is all wood even to the block tinned key, which is lined with wood, and that it is strengthened at the weak part of the ordinary wooden faucet, consequently that it has the strength of a metal faucet without its faults, and all the advantages of a wooden faucet without its weakness.

Streeter's Sensible Ash Sifter.

The illustrations here given are of an ash sifter offered by N. R. Streeter & Co., Groton, N. Y.; New York office,

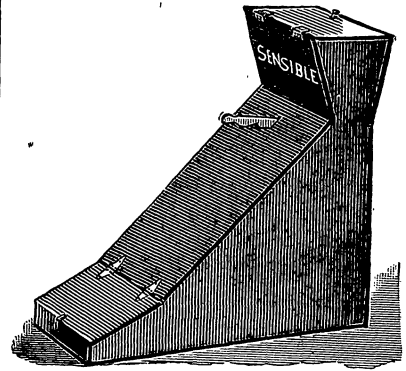


Fig. 1.—Streeter's Sensible Ash Sifter.

W. H. Jacobus, 90 Chambers street. In operation the ashes are emptied into the hopper, the lid closed and the ratchet bar drawn. It is explained that in a moment the coal will be found in a

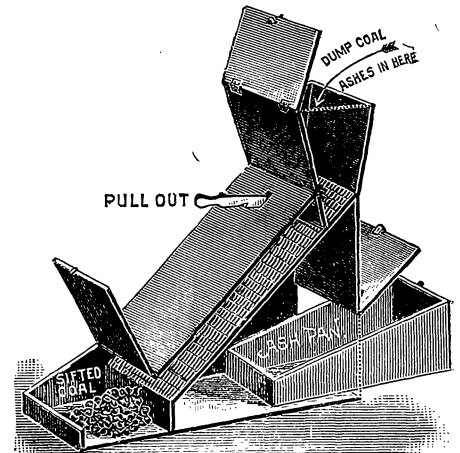
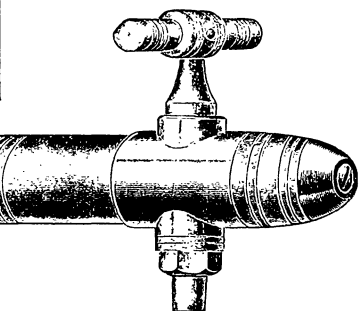


Fig. 2.—Sectional View of Ash Sifter.

drawer at the bottom perfectly separated from the ashes, and that the ashes are retained in the hopper at the top of the sieve and are allowed to go through the sifter at the will of the operator. The manufacturers state that as the coal and ashes both run to closed receptacles



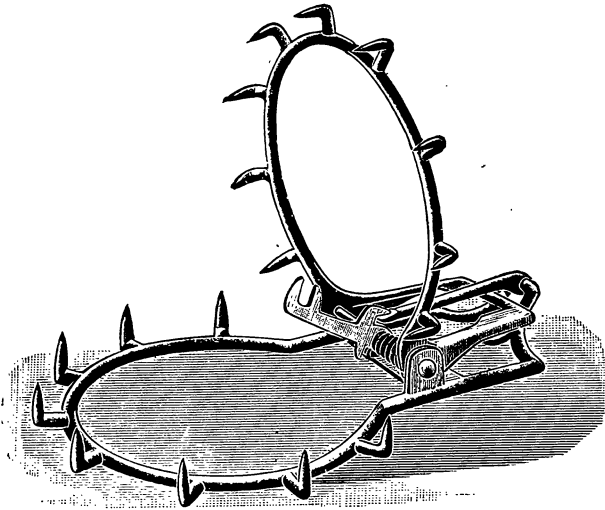
there is no dust. The sifter will be made in both wood and steel, but the manufacturers state that only steel ones are at present ready for market. It is claimed that the steel sifter will last as long as the stove or range from which it gets its supply of ashes.

Challenge Razor Works, Bridgeport, Conn., for whom Wiebusch & Hilger, 84-86 Chambers street, New York, are

sole agents, are making what they have named the Challenge farrier knife. It is referred to as a thoroughly reliable article for horseshoers, having a metal plate at the end of the maple wood handle so that when pressed against a hot shoe in fitting the hoof the handle is not burned or charred.

Streeter's Sensible Rat Trap No. 20.

N. R. Streeter & Co., Groton, N. Y.;
New York office, W. H. Jacobus, 90

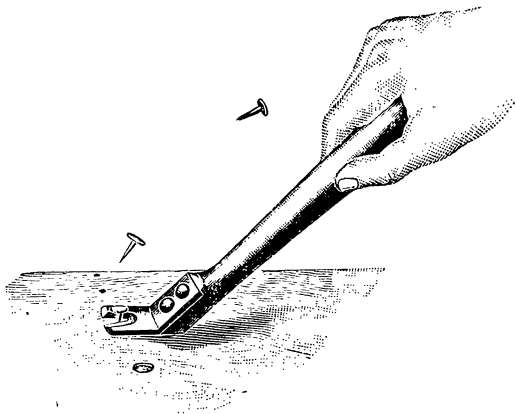


Streeter's Sensible Rat Trap No. 20.

Chambers street, are offering a trap as herewith shown. The trap is made of malleable iron, with a device for setting, which they refer to as simple and effective. A game trap is constructed on the same principle but is larger and is known as No. 30.

The Yankee Tack Puller.

The Browne & Dowd Mfg. Company, Meriden, Conn., are putting out a tack puller, as here shown. It consists of a



The Yankee Tack Puller.

metal handle to which claws are riveted, made from cast steel, tempered. A feature of the puller is the curve of the claws, which is such, it is pointed out, that the claws slide under the head of the tack with ease, and that the tack is pulled without bending. The pullers are nickel plated and are neatly packed, one dozen in a display box.

American Shearer Mfg. Company, Nashua, N. H., have brought out an improved power clipping and grooming

machine. It may be run by steam, water or electric motor power. It operates either a clipper or brush, which can be attached to a Priest's patent all steel flexible shaft and moved at will in any direction, to reach every part at any angle. After clipping the brush is attached to thoroughly and expeditiously remove the short hair, or it can be used for grooming at any time instead of using a curry comb and hand brush. It is said to be especially valuable for grooming nervous or excitable horses who cannot be carried

and groomed in the regular manner. Wiebusch & Hilger, 84-86 Chambers street, are the agents in New York.

Pompeian Bronze Window Screen Cloth.

Clinton Wire Cloth Company, Clinton, Mass., are sending samples of Clinton Pompeian bronze window screen cloth, which the manufacturers claim will not rust or deteriorate, even when exposed to the salt atmosphere of

New Idea Oil and Gasoline Can.

An oil and gasoline can possessing a number of interesting features, so far as its construction is concerned, has recently been placed on the market by A. F. Chable, 2827 Euclid avenue,

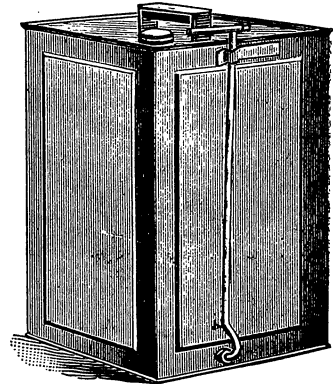


Fig. 1.—New Idea Oil and Gasoline Can.

Cleveland, Ohio. Fig. 1 of the illustrations represents a general view of the can, while Fig. 2 shows the manner in which the can may be emptied of its contents, as, for example, in filling lamps, stove tanks, &c. The emptying tube, which is the principal feature of the can, is formed of a single piece and is bent to the shape shown in Fig. 2. The position which the tube occupies at the side of the can is such as to bring the body portion of it close to the side, thus causing the tube to offer no obstruction as an attachment to the can. The lower inward bent portion of the

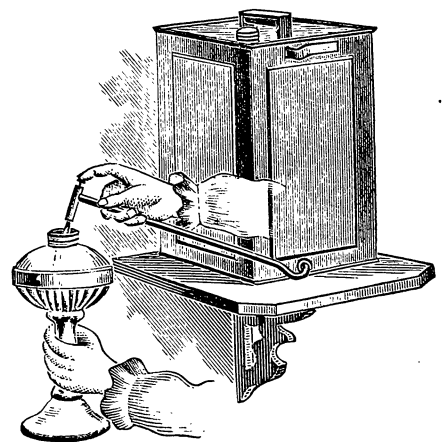


Fig. 2.—Manner of Emptying Can.

tube is threaded, and is secured to the can by the use of a stuffing box. The latter is soldered in the can as near the bottom as possible, so that all the liquid may be readily drawn off. As in Fig. 1, the tube extends slightly above the top of the can, so that when in a raised position and out of use it effectually closes the can against discharge by reason of its length and position. When filling a vessel of any kind, it is only necessary to release the tube at the top and lower it to a horizontal position, when the full pressure of the contents will be exerted and the liquid will be discharged. When the vessel is filled, the flow is instantly stopped by restoring the tube to its upright position.

Ideal Furnace Damper Clips.

Stover Mfg. Company, Freeport, Ill., are offering two styles of furnace damper clips, as here shown. The cir-

to rest in. The clip shown in Fig. 2 is similar to the one described, but it has no bar to join the two leaves together. The manufacturers remark that the use of two leaves and two bearings is

all lost motion. The maker claims for the wrench great strength and unusual adaptability. The tool is now made in four sizes, from 8 to 24 inches.

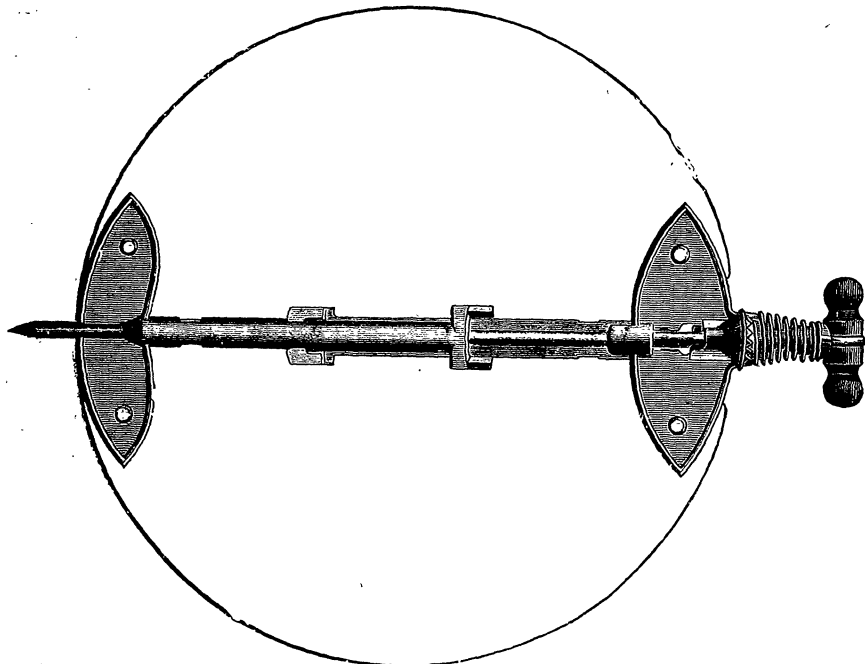


Fig. 1.—Ideal Extension Furnace Damper Clip No. 1.

cular line is designed to represent the damper blade usually supplied by the tinner, which in the extension clip, Fig. 1, is riveted to leaves at opposite sides, and when completed is placed in the pipe in a similar manner to any ordinary stove pipe damper. It is explained that the extension feature permits of using one size clip for different

peculiar to the damper clips made by them, and that they have advantages over clips with but one bearing.

The Wright Wrench.

The wrench here shown is offered by Edward Wright, Worcester, Mass. The wrench is made entirely of steel, and

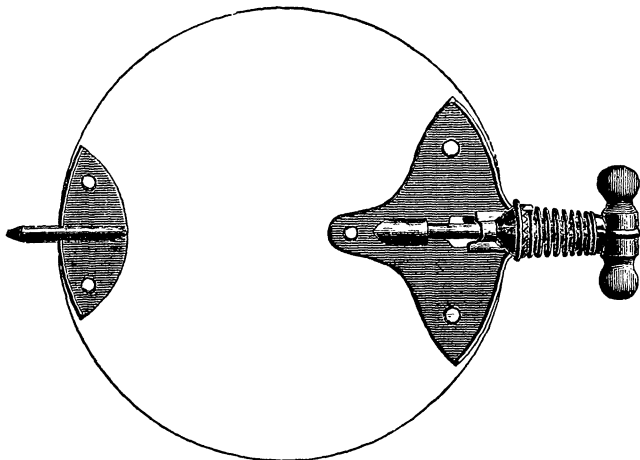
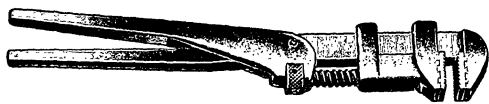


Fig. 2.—Ideal Furnace Damper Clip No. 2.

sizes of dampers from 8 to 12 inches, at the same time retaining the rigid feature of a bar joining the two leaves of the clip together, and thus preventing the heat warping the blade out of shape. It is pointed out that two bearings are employed for properly support-

has drop forged bars and jaws of tool steel. The parts are made to gauge and interchangeable. Both smooth and toothed plates are furnished, either of which may be substituted for the other. The toothed plates may be sharpened or new ones purchased at small cost.



The Wright Wrench.

ing the damper in the pipe and that it is held in any desired position by the friction caused by the pressure of the spring on the collar which bears against the pipe. It is stated that the handle is easily and quickly removed and that the sharp point of the clip is used for making holes in the pipe for the spindle

It is explained that by using the holes in the head of the screw the jaw may be brought up to the work as in a vise. The tool is designed more especially as a pipe wrench, but we are advised that by the substitution of the smooth plates finished parts may be turned without marring, as the sliding jaw takes up

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Current Hardware Prices.

NOVEMBER 14, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Adjusters, Blind—

Domestic..... $\frac{1}{2}$ doz \$3.00, 33% @ 33% & 10%
Excelior..... $\frac{1}{2}$ doz \$10.00.....50 & 10 & 25
North's..... $\frac{1}{2}$ doz.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—

Eagle Anvils, $\frac{1}{2}$ doz.....15 & 15 & 5
Horse shoe brand, Wrought.....94 @ 10 1/4
Barnes Mfg. Co.....50%

Imported—

Armstrong Mouse Hole.....84 @ 9 1/4
S. & H., machine finished.....94 @ 10 1/4
Trenton.....94 @ 10 1/4
Peter Wright's.....94 @ 10 1/4

Anvil Vise and Drill—

Allen Anvil and Vise \$3.00.....40 & 10%
Cheney Anvil and Vise.....25%
Mullers Falls Co., \$18.00.....20%
Holt's.....40 @ 40 & 10%

Apple Parers—See Parers Apple, &c.

Augers and Bits—

Boring Machine Augers.....70 @ 70 & 10%
Car Bits, 12-in. twist.....50%
Common Augers and Bits.....70 @ 70 & 10%
Cincinnati Bell-Hangers' Bits.....40%
Forster Pat. Auger Bits.....25%
Jennings' Pattern Car Bits.....60%
Jennings' Pattern Auger Bits.....60%
A. E. Jennings & Co., No. 10, extension
lip.....40%
C. E. Jennings & Co., No. 30.....60%
O. E. Jennings & Co., Auger Bits, set
32% quaters, No. 5, \$5; No. 30, \$3.50, 25%
Russell Jennings' Augers and Bits, 25 & 40%
Lewis' Patent Single twist.....15 & 10%
L'Hommedieu Car Bits.....20%
Fugh's Black.....30%
Fugh's Jennings Pattern.....30%
Snell's Bits.....60 & 50 @ 60 & 10%

Bit Stock Drills—

Cleveland.....50 & 10%
Morse Twist Drills.....50 & 10%
New Process Twist Drill Co.....50 & 10%
Standard.....50 & 10%
Syracuse, for metal.....40 @ 40 & 10%
Cincinnati, for wood.....50 @ 50 & 10%
Cincinnati, for metal.....50 @ 50 & 10%
Syracuse, for wood (wood list) 30 & 10 @ 40

Expansive Bits—

Clark's small, \$18; large, \$26.....40 @ 40 & 5%
Ives' No. 4, \$20; No. 5, \$20.....40 @ 40 & 5%
Steers', No. 1, \$20; No. 2, \$18.....40 @ 40 & 5%
Stearns' No. 2, \$48.....20%
Swan's.....40 @ 40 & 10%

Gimlet Bits—

Bee.....25 @ 25 & 10%
Common..... $\frac{1}{2}$ gross \$2.50, 30 & 10%
Diamond..... $\frac{1}{2}$ doz \$1.25.....40 & 10%
Double Cut..... $\frac{1}{2}$ gross \$1.00, 40 & 10%
Hartwell's..... $\frac{1}{2}$ gross \$1.00, 40 & 10%
Douglass's.....40 & 10 @ 50%
Ives.....60 & 10 @ 60 & 10 & 5%
Shepardson's.....45 & 10 @ 45 & 10 & 5%

Hollow Augers—

Bonney's Adjustable, $\frac{1}{2}$ doz.....\$21.00
Cincinnati Adjustable.....25 & 10%
Cincinnati Standard.....25 & 10%
Douglass.....33% @ 33% & 10%
French, Swift & Co. (Becher).....33% @ 33% & 10%
Ives'.....33% @ 33% & 10%
Ives' Expansive, each \$4.50.....50 & 5%
Stearns'.....20 & 10%
Universal Expansive, each \$4.50.....20%
Wood's, $\frac{1}{2}$ doz., \$48.....25 & 10%

Ship Augers and Bits—

L'Hommedieu's.....15 & 10 @ 15 & 10 & 5%
Snell's.....25 @ 25 & 10%
Snell's Ship Auger Pat'n Car Bits.....15 & 10 @ 15 & 10 & 5%
Watrous'.....25 @ 25 & 10%

Awl Hafts—See Hafts, Awl.

Awls—

Brad, Handled..... $\frac{1}{2}$ gr. \$2.50 @ \$3.00
Brad, Shouldered..... $\frac{1}{2}$ gr. \$1.30 @ \$1.40
Peg, Pat..... $\frac{1}{2}$ gr. 35 @ 35 & 5
Peg, Should..... $\frac{1}{2}$ gr. \$1.50 @ \$1.65
Scratch, Handled..... $\frac{1}{2}$ doz. \$1.10 @ \$1.20
Scratch, Socket..... $\frac{1}{2}$ doz. \$1.10 @ \$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands.....\$5.00 @ \$6.50
First quality, other brands.....6.50 @ 6.00
Beveled add 50¢ $\frac{1}{2}$ doz.

Axle Grease—See Grease, Axle.

Axles—

No. 1 Common.....3¢
No. 2 Common.....3¢
No. 7 to 14.....47¢
No. 15 to 18.....47¢
No. 19 to 22.....70¢
Concord, loose collar.....4¢
Concord, solid collar.....4¢

Bag Holders—See Holders, Bag.

Balances—

Caldwell, low list.....80%
Fullman.....60%
Sensible.....60%

Spring—

Spring Balances.....40 & 10 @ 50%
Chattillon, No. 2000.....20
Chattillon, $\frac{1}{2}$ doz.....\$2.50, 95¢ @ 75¢ net
Chattillon Straight Balances.....40 @ 40 & 10%
Chattillon Circular Balances.....50 & 10%

Barb Wire—See Wire, Barb.

Bars—

Crow—

Cast Steel..... $\frac{1}{2}$ doz @ 24 @ 24 1/2
Iron, Steel Points..... $\frac{1}{2}$ doz @ 24 @ 24 1/2

Basins, Wash—

Standard Fiberglass, No. 1, 10 1/2-in., \$1.80;
12-inch, \$2.00; 13 1/2-inch, \$2.50.

Beams Scale—

Scale Beams, List Jan. 12, '82.....50 & 10 @ 50 & 10%
Chattillon's No. 1.....50 & 10 @ 50 & 10%
Chattillon's No. 2.....50 & 10 @ 50 & 10%
Custers'.....33%

Beaters—

Egg—

Bryant's..... $\frac{1}{2}$ gross \$14.00
Double (H. & R. Mfg. Co.), $\frac{1}{2}$ gross, No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover..... $\frac{1}{2}$ doz \$1.00; $\frac{1}{2}$ gross, \$10.50
Dover, Ex. Family Size..... $\frac{1}{2}$ doz., \$3.50
Dover (Standard Co.)..... $\frac{1}{2}$ doz \$1.00
Duplex (Standard Co.)..... $\frac{1}{2}$ doz \$1.00
Duplex Extra Heavy (Standard Co.)..... $\frac{1}{2}$ doz, \$3.50
Easy (H. & R. Mfg. Co.)..... $\frac{1}{2}$ doz \$12.00
Improved Acme (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross \$9.00
Silver & Co..... $\frac{1}{2}$ gross \$4.50
Spiral..... $\frac{1}{2}$ gross \$25 @ \$25 & 10%
Triple (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2

Bells—

Cow—

Common Wrought.....60 & 10%
Kentucky Durham.....70 & 10%
Kentucky, Sargent's list.....70 & 10%
Kentucky, "Star".....20 & 10%
Texas Star.....50 & 10 @ 60%
Western, Sargent's list.....70 & 10%

Door—

Crane, Brooks'.....50 & 10 & 2%
Crane, Cone's.....10%
Crane, Connel's.....30 & 10%
Gong, Abbe's.....40 & 10%
Gong, Barton's.....40 & 10%
Gong, Yankee.....45 & 10%
Lever, R. & E. Mfg. Co.'s.....50 & 10 & 2%
Lever, Sargent's.....60 & 10%
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanned.....25 & 10%
Pull, Brooks'.....50 & 10 & 2%

Electric—

Bigelow & Dowse.....20 @ 20 & 10%
Wollensak's.....20 @ 20 & 10%

Hand—

Extra Heavy Brass.....70%
Light Brass.....70 & 10 @ 70 & 10 & 5%
Silver Chime.....33% @ 33% & 10%
White.....70%
Globe Cone's Patent.....25 & 10 @ 35%

Miscellaneous—

Call.....45 @ 50%
Farm Bells..... $\frac{1}{2}$ doz \$2.40
Steel Alloy Church and School Bells.....50%
Bellows—
Blacksmiths'.....60 & 10 @ 70%
Hand Bellows.....50 @ 50 & 10%
Molders'.....50 @ 50 & 10%

Belting, Rubber—

Common Standard.....75 & 10 @ 75 & 10 & 5%
Extra.....60 & 10 @ 60 & 10 & 5%
Standard.....70 & 10 @ 75%
N.Y.B. & P. Co., Carbon.....60 & 10 & 5%
N.Y.B. & P. Co., Double Diamond.....60%
N.Y.B. & P. Co., 1846 Para.....40 & 10%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Brettall Tire Upsetter, \$15.....45%
Detroit Perfect Tire Bender 15 @ 15 & 10%
Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....15%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron.....50 & 10 @ 50 & 10%
Moore's Novelty Mal Iron.....60%
Sure Grip Steel Tackle Blocks, 25 @ 25 & 10%
See also Machines, Hoisting.

Boils—

Carriage, Machine, &c.—

Com. list June 10, '84.....80 & 20 @ 80 & 25%
Genuine Eagle, Norway, list Oct. '84.....80 & 20 @ 80 & 10%
Eagle, Norway, list Oct. '84.....80 & 20 @ 80 & 15%
Phila. pattern, list Oct. 7, '84.....80%
R.B. & W., old list.....70%
Bolt Ends, list Jan. 1, 1890, 80 & 20 @ 80 & 25%
Machine, list Jan. 1, 1890.....80 & 25%

Door and Shutter—

Cast Iron Barrel Square, &c.....75 & 10 @ 75 & 10 & 5%
Cast Iron Chain (Sargent's list).....65 & 10 @ 65 & 10 & 5%
Cast Iron Shutter Bolts, 75 & 10 @ 75 & 10 & 5%
Ives' Patent Door.....60 & 10 @ 60 & 10 & 10%
Wrought Barrel.....75 & 10 @ 80%
Wrt B. K. Flush Common.....60 & 10 @ 60 & 10 & 10%
Wrt Shutter, Brass Knob.....60 & 10 @ 60%
Wrt Shutter, Sargent's list.....60%
Wrt Shutter, all iron, Stanley's.....60%
Wrought Square.....75 & 10 @ 80%
Wrt Sunk Flush, Sargent's list.....60 & 10%
Wrt Sunk Flush, Stanley's list, 60 @ 60 & 10%

Stove and Plow—

Plow.....80 & 10 @ 80 & 10 & 10%
Stove.....70 @ 70 & 25%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....70 & 10%
American Screw Company.....75 & 10%
Norway, Phila., list Oct. 16, '84.....80 & 10%
Eagle, Phila., list Oct. 16, '84.....80 & 10%
Bay State, list Feb. 28, '83.....70 & 10%
Franklin Moore Co.....75 & 10%
Norway, Phila., list Oct. 16, '84.....75 & 10%
Eagle, Phila., list Oct. 16, '84.....80 & 10%
Keystone, Phila., list Oct. 16, '84.....80 & 10%
Norway, Phila., list Oct. 16, '84.....75 & 10%
R. B. & W., Phila., list Oct. 16, '84.....85%

Borers, Tap—

Common and Ring.....20 & 10%
Clark's.....33% @ 35%
Enterprise Mfg. Co.....25%
Ives' Tap Borers.....33% @ 35%

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Letter—

Tatum's.....40

Boxes, Wagon—

Per doz.....24

Boxes, Miter.

Spilker's Excelior, 3 in. \$7.50, 4 in.
\$8.50, 5 in. \$13.00, 6 in. \$15.00.....20%

Braces—

Norw.—Most Braces are sold at net
prices
Barber's.....50 & 10%
Armstrong's.....50 & 5%
Common Ball, American.....\$1.00 @ \$1.10
Davis Patent.....50 & 10%
Fray's Genuine Spofford's.....50 & 10 & 5%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414
70 to 75.....70 & 10 & 5%
New Haven Novelty.....60 & 5 @ 60 & 10%
Barber Ratchet.....60 & 5 @ 60 & 10%
Barber's.....60 & 5%
Spofford.....60 & 5 @ 60 & 10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%

Brackets—

Shelf, fancy, Sargent's list.....70 & 70 @ 10%
Other makes at a wide range of prices.
Shelf, plain, Regular, list.....65 @ 70%
Sargent's list.....60 & 10 @ 70 & 10%
Bradley Shelf Brackets.....75%

Bright Wire Goods—See Wire.

Broilers—

Hens' Self-Inch.....9 10 9x11
Basting, $\frac{1}{2}$ per doz. \$4.50, 5.50, 8.50
Morgan Odorless..... $\frac{1}{2}$ doz. \$12, 50%
New Haven.....50%
Wire Goods Co.....65 & 10%

Buckets, Well and Fire—See Pails.

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butchers.

Butts—

Brass—

Cast Brass, Fast.....33% @ 10%
Cast Brass, Loose Joint.....33% @ 10%
Cast Brass, Tiebout's.....50%
Wrought Brass.....80 & 10 @ 80 & 20%

Cast Iron—

Fast Joint, Broad.....60 & 10 @ 60 & 10 & 10%
Fast Joint, Narrow.....60 @ 60 & 10%

Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned.....
Loose Pin, Acorns, Japanned.....
Plated Tips.....
Mayer's Hinges.....
Parliament Butts.....

Wrought Steel—

Fast Joint, Broad.....
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Inside Blind, Light.....
Inside Blind, Regular.....
Loose Joint, Broad.....
Loose Pin.....
Table Butts, Back Flaps, &c.....
Bronzed Wrought Butts.....

Cages, Bird—

Hendryx Brass:
3000, 5000, 1100 series.....10%
1200 series.....40%
200, 300, 600 and 900 series.....40 & 10 @ 50%
Hendryx Bronze:
700, 800 series.....40 & 10 @ 50%
Hendryx Enameled.....40 & 10 @ 50%

Callipers—See Compasses.

Calks—

Burke's, One Prong, Blunt.....44 @ 55
Burke's, One Prong, Sharp.....54 @ 65
Burke's, Two Prong, Blunt.....54 @ 65
Burke's, Two Prong, Sharp.....54 @ 65
Gautier, One Prong, Blunt.....54 @ 65

CanOpeners—See Openers, Can.

Cans Milk—

S. S. & Co., 5-gal., \$3.00; 8-gal., \$4.40;
10-gal., \$4.75 each.....40 & 10

Cans Oil—

Galvanized Blue Band, 1 gal., $\frac{1}{2}$ doz. \$2.35
Galvanized Blue Band, 5 gal., $\frac{1}{2}$ doz. \$11.00
Galvanized Blue Band, 5 gal., Faucet,
Glass Oil, Friend..... $\frac{1}{2}$ doz. \$3.75

Caps—Percussion—

Eley's E. B.....52 @ 55¢
Hicks & Goldmark's and Union Metallic
Cartridge Co.....
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47 @ 50¢
E. B. Trimmer Edge, 1-10's.....47 @ 50¢
F. L. Waterproof, 1-10's.....47 @ 50¢
G. D.....27 @ 30¢
Musket, Waterproof, 1-10's.....50 @ 53¢
S. B. Genuine Imported.....45%

Primers—

Berdan Primers, \$1.00.....2%
E. L. Caps (Sturtevant Shells) \$1.00.....2%
All other Primers, \$1.20.....2%

Cards—

Watson's Cotton, Wool, Horse and
File, list January 28, 1891.....10%

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Con. Ball, Swad., \$1.85 @ \$1.90
B. B. Caps, Round Ball.....\$1.60 @ \$1.65
Blank Cartridges, except 22 and 32 cal.,
additional 10% to above discounts.
Blank Cartridges, 22 cal., \$1.75.....25%
Blank Cartridges, 32 cal., \$3.50.....45%
Cent. Fire, Military and Sporting.....15 & 25%
Cent. Fire, Pistol and Rifle.....25 & 35%
Primed Shells and Bullets.....15 & 25%
Rim Fire Cartridges.....50 & 55%
Rim Fire Military.....15 & 25%

Carpet Sweepers—

See Sweepers, Carpet.

Casters—

Bed.....
Plate.....
Shallow Socket.....60 & 10 @ 60 & 10 & 10%
Deep Socket.....60%
Giant Truck Casters.....35%
Gwinner's Common Senses.....45 @ 50%
Gwinner's Hercules.....45 @ 50%
Martin's Patent (Hoxby), 45 & 10 @ 50 & 10%
Payson's Anti-Friction.....70 @ 70 & 10%
Payson's Truck.....60 @ 60 & 10%
Socket Truck Casters.....50 @ 50 & 10%
Stationary Truck Casters.....50 & 10%
Tatum's Truck.....60 @ 60 & 10%
Tucker's Patent, low list.....45%
Yale Casters, low list.....45%

Halters—

Covert's Adj. Rope Halters.....40&25
Covert's Adj. Web Halters.....85&52
Covert's Hemp Horse and Cattle Tie.....50&10&25
Covert's Jute Cattle Ties.....70&10&25
Covert's Jute Horse Ties.....70&25
Covert's Rope, 7-16 in., Jute.....70&25
Covert's Rope, 3-4 in., Hemp.....35&25
Covert's Rope, Jute.....60&10&10&25
Covert's Saddlery Works Halters.....35&25
Covert's Saddlery Works Handy Web Halters.....35&25
Covert's Saddlery Works Horse and Cattle Ties.....35&25

Hammers—

Handled Hammers—
Atha Tool Co.....50&10&20
Hudson & Beckley.....50&10&20
Verree.....40&10
Cheney's Claw.....40&10
Cheney's Machinist's & Riveting.....50&25
C. Hammond & Son.....40&10&20
Magnetic Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....40&10&20
Maydole's, 1894 list.....25&10&20
Peck, Stow & Wilcox.....40&10&20
Fayette R. Plumb.....40&10&20
Artisans' Choice, A. E. Nail.....40&10&20
Engineers' and B. S. Hand.....60&10
Machinist's Hammers.....60&10
Plain V. & P. A. E. Nail.....40&10&20
Other Nail Hammers.....60&10
Sargent's.....40&10&20
Warner & Nobles, new list.....25&10

Heavy Hammers and Sledges—

3 lb and under.....\$4.00
5 to 6 lb.....\$5.00
Over 5 lb.....\$6.00
Wilkinson's Sledge.....100&100

Handcuffs and Leg Irons—

See Police Goods.

Handles—

Cross-Cut Saw Handles—
Atkins.....40
Champion.....45&45&10
Ely's Perfection.....40&30
Sensible per doz. Pr.....\$5.00, 60&50&10

Iron, Wrought or Cast—

Barn Door, per doz.....20&25
Bronze Iron Drop Latches.....per doz
Cheet, Sargent's list.....50&10&20
Door or Thumb.....0
Per doz.....\$0.90, 1.00, 1.08, 1.35, 1.50
Jap'd Store Door Handles—Nuts, \$1.25
Plate, \$1.10; no plate, \$0.88.....10
Boggin's Latches.....per doz 25&30

Wood—

Auger, assorted.....per gr 5.00
Auger, large.....per gr 1.00
File, assorted.....per gr 2.75
Brad Axl.....per gr 2.00
Apple Firmer Chisel, ass'd.....per gr 6.00
Apple Firmer Chisel, large.....per gr 6.00
Hickory Firmer Chisel, ass'd.....per gr 4.50
Hickory Firmer Chisel, large.....per gr 6.00
Socket Firmer Chisel, ass'd.....per gr 3.00
Socket Firmer Chisel, large.....per gr 5.00
Chisel, Fibre Head.....33&35
Hammer, Hatchet, Axe, &c.....40&40&25
Hoe, Rake, Shovel, &c.....60&10
Pat. Auger, Douglas.....per set \$1.25
Pat. Auger, Ives.....30&10
Pat. Auger, Swan's.....per set \$1.00
Saw and Plane.....40&10&20

Hangers—

Barn Door, New England.....70&70&25
Barn Door, old patterns.....70&70&25
Barry.....60
Best Anti-Friction.....60&10&20
Boss.....60&10&20
Carrier Steel Anti-Friction.....50&10
Champion.....60&10
Chicago Anti-Friction.....30&10
Climax Anti-Friction.....55&55&25
Crescent.....60&60&10
Cronk's Patent Steel Covered.....60&10&20
Duplex (Wood Track).....60&10&20
Economy, \$3.00.....60&10
Hamilton Wrought Steel Track.....55
Interstate.....60&60&10
Kidder's.....60&60&10
Lane's New Standard.....60&60&25
Lane's Parlor.....40&40&25
Lane's Standard.....50&50&10
Lundy Steel Parlor.....40
Magic.....50&50&25
Matchless.....60&60&25
Moody.....45
Moore's Baggage Car Door.....35&25
Moore's Elevator.....35
Moore's Railroad.....55
Nickel Steel, Nos. 0, 25; 1, \$20; 2, \$16.....40&10&20
Orleans Steel.....55
Paragon No. 1, \$3.50; No. 2, \$4.50; No. 3, \$5.50 per doz.....\$2.00
Paragon Parlor, per set.....\$2.00
Pendulum, Payson's.....40&40&10
Perfection.....50&10&20
Richards.....30&30&10
Samson Steel Anti-Friction.....55
Star.....40&10&20
Stearns' Anti-Friction.....20&10&10
Stearns' Challenge.....25&10&10
Sterling.....50&10&20
Terry's Ideal.....50&10&20
Terry's Modern.....50&10&20
Terry's Shield.....50&10&20
Terry's Solid.....50&10&20
Terry's Wrought Single Strap.....60&10
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....\$13.00
Warner's Pat.....20&10&10
Wild West.....50&50&25
Zenith for Wood Track.....55

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.....40 & 10
Blood's.....50
Hunt's.....50
Hurd's.....50
Mann's.....50
Underhill's.....50
O. Hammond & Son.....10
Fayette R. Plumb.....10
Collins.....10
Buffalo Hammer Co.....10
Kelly's.....50 & 50
P. & W. Co.....10
Sargent & Co.....10
Schulte, Lohoff & Co.....10
Ten Eyck Edge Tool Co.....10

Hay and Straw Knives

See Knives.

Hinges—**Blind Hinges—**

Clark's Nos. 1, 3, 5, 1883, Old Pattern.....75&10&25

Nos. 1 and 3, Tip Pattern.....75&10&25

No. 50 Buffalo Noiseless, 40, 60 and 85.....75

Buffalo Reversible, Nos. 3, 2, 1, 4 and 5.....70&25

No. 1, Cottage, for wood only.....30&10

No. 1, Diamond, for wood only.....80&5

Dixie L. & P., Nos. 3, 2, 4, 2, 1, 4, 1, 0, 4 and 5.....75&10

No. 25, Empire Reversible.....75&10

Lull & Porter, Nos. 3, 2, 2, 1, 4, 1, 0, 0, 4 and 5.....75&10

Mortise Grub, Nos. 2, 4, 7, 8, 8, 9 and 10.....50

Huffer.....50&50&10

Parker.....75&10

North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$1.50.....10

Reading's Gravity.....75&10&25

Sargent's Nos. 1, 3, 5, 11, 12, 13.....75&10&25

Shepard's.....75&10&25

Acme, Lull & Porter, Nos. 3, 2, 4, 1, 0, 0, 4 and 5.....75&10

Buffalo Gravity Locking, Nos. 1, 3 and 5.....80&5

Champion Gravity Locking, No. 75.....80&10

Clark's or Shepard's 1883, Old Pat. tern, Nos. 1, 3 and 5.....75&10&25

Clark's or Shepard's Tip Pattern, Nos. 1, 3 and 5.....75&10&25

Double Locking, Nos. 20 and 25.....70&25

Empire, Nos. 101 and 103.....75&10

Niagara Gravity Locking, Nos. 1, 3 and 5.....80&5

Noiseless, Nos. 50, 60, 65 and 55.....75

O. S. Lull & Porter, Nos. 3, 2, 4, 1, 0, 0, 4 and 5.....75&10&25

Pioneer, Nos. 080, 45 and 54.....75

Steamboat Gravity Locking No. 10.....80&10

Gate Hinges—

Automatic.....per doz \$12.50, 50

Clark's, Nos. 1, 2, 4, 5.....60&10&20

N. E. R. & P. Co., Nos. 60, 80, 100.....60&10

N. E. Reversible.....per doz \$5.00, 60&60&10

N. Y. State.....per doz \$4.00, 60&60&10

Shepard's Nos. 1, 2, 3.....60&10&20

Western.....per doz \$4.20, 60&60&10

Spring Hinges—

Acme.....30

American.....20

Bardley's Patent Checking.....15

Bardley's Patent Acting.....15

Bommer's Japanned.....35

Bommer's All other Kinds.....30

Buckman's.....15&20

Champion.....60

Chicago.....30

Columbia.....per gross, \$10.00

Crown.....30

Devore, No. 1.....per gross, \$18.00

Freeport.....per gross, \$12.00

Geer's Spring and Blank Butts.....40

Gem.....20

Ideal No. 3.....per gross \$8.00

G. G. Covered, per gross.....\$30.00

Kendall, per gross.....\$12.00

New Idea No. 1.....per gross \$10.00

New Idea No. 2.....per gross, \$18.00

New Idea Dbl. Acting.....45

No. 10 Matchless.....60

No. 25 Unbreakable.....60

Reliable.....60

Rex.....per gross, \$13.00

Royal.....60

Samson.....60&60&75

Stearns' Noiseless Floor Hinge.....per set, \$5.00, 20&10&30

Surprise.....per gross, \$12.00

Union Mt. Co., Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....25

Union Spring Hinge Co.'s list, March, 1886.....20

Wiles, No. 1, per gross, \$10; No. 2.....\$13

Wrought Iron Hinges—

Stran and T. List May.....60&10&10

22, 1894.....60&10&10

Corrug'd Strap and T. List.....60&10&10

Gate Hinges, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....45

Providence, over 12 in., per doz.....45

Roller Blind Hinges, Nos. 32 and 34.....60&10

Roller Blind Hinges, Nos. 252 and 234.....55&10

Roller Plate.....70&10

Roller Raised.....70&10

Screw Hook and Eye.....per doz, 1/2 in., \$1.75; 3/4 in., \$2.00; 1 in., \$2.25; 1 1/4 in., \$2.50; 1 1/2 in., \$2.75; 1 3/4 in., \$3.00; 2 in., \$3.25; 2 1/4 in., \$3.50; 2 1/2 in., \$3.75; 2 3/4 in., \$4.00; 3 in., \$4.25; 3 1/4 in., \$4.50; 3 1/2 in., \$4.75; 3 3/4 in., \$5.00; 4 in., \$5.25; 4 1/4 in., \$5.50; 4 1/2 in., \$5.75; 4 3/4 in., \$6.00; 5 in., \$6.25; 5 1/4 in., \$6.50; 5 1/2 in., \$6.75; 5 3/4 in., \$7.00; 6 in., \$7.25; 6 1/4 in., \$7.50; 6 1/2 in., \$7.75; 6 3/4 in., \$8.00; 7 in., \$8.25; 7 1/4 in., \$8.50; 7 1/2 in., \$8.75; 7 3/4 in., \$9.00; 8 in., \$9.25; 8 1/4 in., \$9.50; 8 1/2 in., \$9.75; 8 3/4 in., \$10.00; 9 in., \$10.25; 9 1/4 in., \$10.50; 9 1/2 in., \$10.75; 9 3/4 in., \$11.00; 10 in., \$11.25; 10 1/4 in., \$11.50; 10 1/2 in., \$11.75; 10 3/4 in., \$12.00; 11 in., \$12.25; 11 1/4 in., \$12.50; 11 1/2 in., \$12.75; 11 3/4 in., \$13.00; 12 in., \$13.25; 12 1/4 in., \$13.50; 12 1/2 in., \$13.75; 12 3/4 in., \$14.00; 13 in., \$14.25; 13 1/4 in., \$14.50; 13 1/2 in., \$14.75; 13 3/4 in., \$15.00; 14 in., \$15.25; 14 1/4 in., \$15.50; 14 1/2 in., \$15.75; 14 3/4 in., \$16.00; 15 in., \$16.25; 15 1/4 in., \$16.50; 15 1/2 in., \$16.75; 15 3/4 in., \$17.00; 16 in., \$17.25; 16 1/4 in., \$17.50; 16 1/2 in., \$17.75; 16 3/4 in., \$18.00; 17 in., \$18.25; 17 1/4 in., \$18.50; 17 1/2 in., \$18.75; 17 3/4 in., \$19.00; 18 in., \$19.25; 18 1/4 in., \$19.50; 18 1/2 in., \$19.75; 18 3/4 in., \$20.00; 19 in., \$20.25; 19 1/4 in., \$20.50; 19 1/2 in., \$20.75; 19 3/4 in., \$21.00; 20 in., \$21.25; 20 1/4 in., \$21.50; 20 1/2 in., \$21.75; 20 3/4 in., \$22.00; 21 in., \$22.25; 21 1/4 in., \$22.50; 21 1/2 in., \$22.75; 21 3/4 in., \$23.00; 22 in., \$23.25; 22 1/4 in., \$23.50; 22 1/2 in., \$23.75; 22 3/4 in., \$24.00; 23 in., \$24.25; 23 1/4 in., \$24.50; 23 1/2 in., \$24.75; 23 3/4 in., \$25.00; 24 in., \$25.25; 24 1/4 in., \$25.50; 24 1/2 in., \$25.75; 24 3/4 in., \$26.00; 25 in., \$26.25; 25 1/4 in., \$26.50; 25 1/2 in., \$26.75; 25 3/4 in., \$27.00; 26 in., \$27.25; 26 1/4 in., \$27.50; 26 1/2 in., \$27.75; 26 3/4 in., \$28.00; 27 in., \$28.25; 27 1/4 in., \$28.50; 27 1/2 in., \$28.75; 27 3/4 in., \$29.00; 28 in., \$29.25; 28 1/4 in., \$29.50; 28 1/2 in., \$29.75; 28 3/4 in., \$30.00; 29 in., \$30.25; 29 1/4 in., \$30.50; 29 1/2 in., \$30.75; 29 3/4 in., \$31.00; 30 in., \$31.25; 30 1/4 in., \$31.50; 30 1/2 in., \$31.75; 30 3/4 in., \$32.00; 31 in., \$32.25; 31 1/4 in., \$32.50; 31 1/2 in., \$32.75; 31 3/4 in., \$33.00; 32 in., \$33.25; 32 1/4 in., \$33.50; 32 1/2 in., \$33.75; 32 3/4 in., \$34.00; 33 in., \$34.25; 33 1/4 in., \$34.50; 33 1/2 in., \$34.75; 33 3/4 in., \$35.00; 34 in., \$35.25; 34 1/4 in., \$35.50; 34 1/2 in., \$35.75; 34 3/4 in., \$36.00; 35 in., \$36.25; 35 1/4 in., \$36.50; 35 1/2 in., \$36.75; 35 3/4 in., \$37.00; 36 in., \$37.25; 36 1/4 in., \$37.50; 36 1/2 in., \$37.75; 36 3/4 in., \$38.00; 37 in., \$38.25; 37 1/4 in., \$38.50; 37 1/2 in., \$38.75; 37 3/4 in., \$39.00; 38 in., \$39.25; 38 1/4 in., \$39.50; 38 1/2 in., \$39.75; 38 3/4 in., \$40.00; 39 in., \$40.25; 39 1/4 in., \$40.50; 39 1/2 in., \$40.75; 39 3/4 in., \$41.00; 40 in., \$41.25; 40 1/4 in., \$41.50; 40 1/2 in., \$41.75; 40 3/4 in., \$42.00; 41 in., \$42.25; 41 1/4 in., \$42.50; 41 1/2 in., \$42.75; 41 3/4 in., \$43.00; 42 in., \$43.25; 42 1/4 in., \$43.50; 42 1/2 in., \$43.75; 42 3/4 in., \$44.00; 43 in., \$44.25; 43 1/4 in., \$44.50; 43 1/2 in., \$44.75; 43 3/4 in., \$45.00; 44 in., \$45.25; 44 1/4 in., \$45.50; 44 1/2 in., \$45.75; 44 3/4 in., \$46.00; 45 in., \$46.25; 45 1/4 in., \$46.50; 45 1/2 in., \$46.75; 45 3/4 in., \$47.00; 46 in., \$47.25; 46 1/4 in., \$47.50; 46 1/2 in., \$47.75; 46 3/4 in., \$48.00; 47 in., \$48.25; 47 1/4 in., \$48.50; 47 1/2 in., \$48.75; 47 3/4 in., \$49.00; 48 in., \$49.25; 48 1/4 in., \$49.50; 48 1/2 in., \$49.75; 48 3/4 in., \$50.00; 49 in., \$50.25; 49 1/4 in., \$50.50; 49 1/2 in., \$50.75; 49 3/4 in., \$51.00; 50 in., \$51.25; 50 1/4 in., \$51.50; 50 1/2 in., \$51.75; 50 3/4 in., \$52.00; 51 in., \$52.25; 51 1/4 in., \$52.50; 51 1/2 in., \$52.75; 51 3/4 in., \$53.00; 52 in., \$53.25; 52 1/4 in., \$53.50; 52 1/2 in., \$53.75; 52 3/4 in., \$54.00; 53 in., \$54.25; 53 1/4 in., \$54.50; 53 1/2 in., \$54.75; 53 3/4 in., \$55.00; 54 in., \$55.25; 54 1/4 in., \$55.50; 54 1/2 in., \$55.75; 54 3/4 in., \$56.00; 55 in., \$56.25; 55 1/4 in., \$56.50; 55 1/2 in., \$56.75; 55 3/4 in., \$57.00; 56 in., \$57.25; 56 1/4 in., \$57.50; 56 1/2 in., \$57.75; 56 3/4 in., \$58.00; 57 in., \$58.25; 57 1/4 in., \$58.50; 57 1/2 in., \$58.75; 57 3/4 in., \$59.00; 58 in., \$59.25; 58 1/4 in., \$59.50; 58 1/2 in., \$59.75; 58 3/4 in., \$60.00; 59 in., \$60.25; 59 1/4 in., \$60.50; 59 1/2 in., \$60.75; 59 3/4 in., \$61.00; 60 in., \$61.25; 60 1/4 in., \$61.50; 60 1/2 in., \$61.75; 60 3/4 in., \$62.00; 61 in., \$62.25; 61 1/4 in., \$62.50; 61 1/2 in., \$62.75; 61 3/4 in., \$63.00; 62 in., \$63.25; 62 1/4 in., \$63.50; 62 1/2 in., \$63.75; 62 3/4 in., \$64.00; 63 in., \$64.25; 63 1/4 in., \$64.50; 63 1/2 in., \$64.75; 63 3/4 in., \$65.00; 64 in., \$65.25; 64 1/4 in., \$65.50; 64 1/2 in., \$65.75; 64 3/4 in., \$66.00; 65 in., \$66.25; 65 1/4 in., \$66.50; 65 1/2 in., \$66.75; 65 3/4 in., \$67.00; 66 in., \$67.2

Plate.
Bomer's Night Latches.....15¢
R. & H. Mfg. Co., list Mar. 90, 1889.....60¢
Sargent & Co., list July, 1894, 60¢
Warner's Burglar Proof.....doz. \$3.00, 50¢

Elevator—

Moore's.....88¢

Padlocks—

Wrought Iron Padlocks.
Britannia, Graham & Mathes, list Jan. 1894.....75¢
Mallory, Wheeler Co., list Jan. 1, 1894.....75¢
Norwich Lock Mfg. Co., list June 10, 1891.....60¢
Russell & Erwin Mfg. Co., list June 10, 1891.....60¢
Sargent & Co., list January 1, 1894.....75¢
William Wilcox Mfg. Co., list January 1, 1894.....75¢
Ames Sword Co. up to No. 103 incl. 50¢
Ames Sword Co. above No. 103.....60¢
Barnes Mfg. Co.....40¢
Champion Padlocks.....40¢
A. E. Deitz.....40¢
Eagle.....40¢
Eureka, Eagle Lock Co.....40¢
J. T. Fralim's Keystone Scandinavian.....100 line.....90¢
120 line.....90¢
109 line.....85¢
510 line.....70¢
225, 610 and 209 lines.....70¢
All other numbers.....50¢
Horseshoe.....doz. \$9.50
Hotchkiss.....30¢
Knox's.....30¢
Bomer's Nos. 0 to 91.....30¢
Bomer's Scandinavian, &c., Nos. 100 to 505.....15¢
Scandinavian.....90¢
Blaymaker, Barry & Co.....90¢
No. 101 line.....90¢
No. 41 line.....50¢
No. 61 line.....80¢
No. 21 line.....70¢
No. 109 line.....90¢
Star.....doz. \$1.00
Yale Lock Mfg. Co.'s.....net prices

Sash, &c.—

Attwell Mfg. Co.....25¢
Champion Safety list January, 1893, 70¢
Clark's No. 1, \$10; No. 2, \$8.....35¢
Common Sense, Jap'd, Cop'd and Brzd.....gr \$4.00
Common Sense, Nickel Plated.....gr \$10.00
Corbin's Daisy, list Feb. 15, 1888.....70¢
Davis Bronze, Barnes Mfg. Co.....70¢
Ferguson's.....35¢
Fish (Liesche's pat.), No. 100, gr. \$3; No. 105, gr. \$10.....50¢
Giant, list Jan. 1892.....70¢
Hammond's Window Springs.....40¢
Huganin's New Sash Locks.....25¢
Huganin's Sash Balances.....25¢
Ives' Patent.....60¢
Kempshall's Gravity.....80¢
Kempshall's Model.....80¢
Monarch.....60¢
Payson's Perfect.....60¢
Reading.....60¢
Security.....70¢
Universal.....80¢
Victor.....60¢
Walker's.....10¢
Wolcott's.....60¢

Lumber Tools—

See Tools, Lumber.
Lustro—
our-ounce bottles.....doz. \$1.75; gr gross.....\$17.00

Machines.

Boring—
Without Augers, Upright, Angular.
Boss, Carpenters' 3.50
Boss, Ship Bldrs' 3.75
Doughs.....\$6.75
Jennings.....5.50
Muller's Falls.....7.50
Phillip's Patent with Auger.....7.00
Snell's, Rice's Pat 5.50.....6.75

Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35¢
Combined Fluter and Sad Iron.....80¢
Crown, 4 in., \$3.50; 6 in., \$4.00; 8 in., \$5.50 each.....35¢
Crown Hand Fluter, No. 1, \$15.00; No. 2, \$12.50; No. 3, \$10.00; 4, \$8.25.....30¢
Crown Jewel, 6 in.....\$3.50 each
Domestic Fluter.....each, \$1.50
Eagle, 3 1/4 inch Rolls, \$2.15.....35¢
Eagle, 4 1/4 inch Rolls, \$2.25.....35¢
Knox, 4 1/4 inch Rolls, \$3.25 each.....85¢
Knox, 6 inch Rolls.....\$3.60 each

Holting—

Moore's Anti-Friction Differential Pulley Block.....20¢
Moore's Hand Holst, with Lock Brake, 20¢
Moore's Rope Differential Pulley Block.....60¢
Maris & Beekley (Teal Patent).....30¢
See also Blocks.

Washing—

Fair and Square.....doz \$42.00
Anthony Wayne, No. 1, \$42; No. 2, \$38; No. 3, \$42.....doz \$38.00
Wayne American.....doz \$36.00
Western Star, No. 2, \$38; No. 3, \$39.....doz \$36.00

Mallets—

S. & L. Block Co., Hickory & L. V. 80¢
Fibre Head, Stearns.....53¢
Hickory.....20¢
Lignumvite.....20¢

Mattocks—

Regular list.....80¢

Measures—

standard Fibreware, No. 1, peck 7 doses, \$3.50; 4-peck, \$3.00

Meat Cutters—

See Cutters, Meat.

Menders—

Harness.....doz. \$1.75
Hudson's Hose Menders, in set, doz. \$3.00

Hudson's Hose Bands.....gr. \$1.25

Milk Cans—See Cans, Milk.

Mills—

Coffee—
Box and Side, list Jan. 1, 1888, 60¢
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 1, 1888.....20¢
National list, Jan. 1, 1894.....30¢
Swift, Lane Bros.....30¢
Waddell's New Box Mills, Ideal Brand, New List.....40¢

Mining Knives—

See Knives, Mining.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

10 in. 12 in. 14 in.
Best.....\$4.00 to \$5.25
Good.....\$3.00 to \$3.25
Cheap.....2.25 to 2.50

Muzzles—

Safety.....doz. \$3.00, 55¢

Nails—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92.....85¢

Horse—

Nos. 6 7 8 9 10
A. C.....25¢
American.....9¢
Anchor.....25¢
Ausable.....25¢
Capewell.....10¢
C. B. K.....25¢
Champion.....25¢
Champlain.....25¢
Clinton, Fin.....10¢
Empire Bronzed.....10¢
Essex.....25¢
Lyra.....9¢
Maud S.....25¢
Northwest'n.....25¢
Putnam.....25¢
Snowden.....9¢
Standard.....25¢
Vulcan.....25¢
Western.....25¢

Picture—

Brass Head, Combination list.....50¢
Brass Head, Sargent's list.....60¢
Porcelain Head, Combination list.....40¢
Porcelain Head, Sargent's list.....40¢
Niles' Patent.....40¢

Picture—

Brass Head, Combination list.....50¢
Brass Head, Sargent's list.....60¢
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Niles' Patent.....40¢

Picture—

Brass Head, Combination list.....50¢
Brass Head, Sargent's list.....60¢
Porcelain Head, Combination list.....40¢
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Niles' Patent.....40¢

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Pails—

Creamery—
S. S. & Co. 18-qt., \$7.00; 20-qt., \$7.25
doz. \$84.00

Galvanized Pails—

10 Quart.....\$2.00 to \$2.25
12 Quart.....2.25 to 2.50
14 Quart.....2.50 to 2.75

Galvanized Buckets—

10 Quart.....\$2.50 to \$2.75
12 Quart.....2.75 to 3.00
14 Quart.....3.00 to 3.25

Indurated Fiber Ware—

Fire Pails, deep.....doz \$4.80
Fire Pails, round bottom.....doz \$5.40
Milk, 14 qt.....doz \$5.40
Stable, 14 qt.....doz \$5.40
Star Pails, 12 qt.....doz \$4.20

Standard Fiber Ware—

Buggy Pails.....\$3.00
Chamber Pails, 14 qt.....6.00
Dairy Pails, 14 qt.....3.75
Fire Pails, No. 1, 12 qt.....3.75
Fire Pails, No. 2, 14 qt.....4.25

Pans—

Large sizes.....doz \$5.50
Small sizes.....doz \$5.50
Silver & Co. (Covered).....40¢

Dripping—

Standard list:
No. 1.....\$1.75
No. 2.....\$1.75
No. 3.....\$1.75
No. 4.....\$1.75
No. 5.....\$1.75
No. 6.....\$1.75
No. 7.....\$1.75
No. 8.....\$1.75
No. 9.....\$1.75
No. 10.....\$1.75

Fry—

Standard list:
No. 1.....\$1.75
No. 2.....\$1.75
No. 3.....\$1.75
No. 4.....\$1.75
No. 5.....\$1.75
No. 6.....\$1.75
No. 7.....\$1.75
No. 8.....\$1.75
No. 9.....\$1.75
No. 10.....\$1.75

Dust—

Steel Edge, No. 1.....doz \$1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, \$2; 20, \$2.25; 30, \$2.50 each.....60¢

Paper and Cloth—

Sibley's Emery and Crocus Cloth.....30¢

Parers—

Advance.....doz \$1.50
Baldwin.....doz \$1.50
Barnes.....doz \$1.50
Daisy.....doz \$1.50
Dandy.....doz \$1.50
Eclipse.....doz \$1.50
Eureka, 1888.....doz \$1.50
Family Bay State.....doz \$1.50
Fowler.....doz \$1.50
Gold Medal.....doz \$1.50
Ideal.....doz \$1.50
Improved Bay State.....doz \$1.50
Little Star.....doz \$1.50
Monarch.....doz \$1.50
New Lightning.....doz \$1.50
Orion.....doz \$1.50
Penn.....doz \$1.50
Perfection.....doz \$1.50
Reading 72.....doz \$1.50
Reading 78.....doz \$1.50
Rocking Table.....doz \$1.50
Turn Table.....doz \$1.50
Water.....doz \$1.50
White Mountain.....doz \$1.50

Apple—

Advance.....doz \$1.50
Baldwin.....doz \$1.50
Barnes.....doz \$1.50
Daisy.....doz \$1.50
Dandy.....doz \$1.50
Eclipse.....doz \$1.50
Eureka, 1888.....doz \$1.50
Family Bay State.....doz \$1.50
Fowler.....doz \$1.50
Gold Medal.....doz \$1.50
Ideal.....doz \$1.50
Improved Bay State.....doz \$1.50
Little Star.....doz \$1.50
Monarch.....doz \$1.50
New Lightning.....doz \$1.50
Orion.....doz \$1.50
Penn.....doz \$1.50
Perfection.....doz \$1.50
Reading 72.....doz \$1.50
Reading 78.....doz \$1.50
Rocking Table.....doz \$1.50
Turn Table.....doz \$1.50
Water.....doz \$1.50
White Mountain.....doz \$1.50

Potato—

Antrim Combination.....doz \$5.50
Saratoga.....doz \$5.50
White Mountain.....doz \$5.50

Pencils, Soapstone—

See Crayons.

Pickers, Fruit—

Prize Fruit Pickers.....50¢

Picks—

Railroad or Adse Eye, 5 to 6, \$12.00; 6 to 7, \$15.00.....60¢

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—

Humason, Beekley & Co.'s.....70¢
Peck, Stow & W. Co.....60¢
Sargent & Co.'s, \$17 and \$18.....60¢

Escutcheon—

Brass.....70¢
Iron, list Nov. 11, 1885.....75¢

Pipe, Wrought Iron—

1 1/2 and under, Plain, 57 1/2 to 10 1/2 x 5 1/2
1 1/2 and under, Galv.....50¢
1 1/2 and over, Plain.....67 1/2 to 10 1/2 x 5 1/2
1 1/2 and over, Galv.....67 1/2 to 10 1/2 x 5 1/2
Boiler Tubes, list Oct. 24, 1892.....65¢

Casing, list Nov. 16, 1892.

62 1/2 to 10 1/2 x 5 1/2
Cold Drawn Seamless Steel Tubing.....50¢
Inserted Joints Casing, list Nov. 16, 1892.....47 1/2 to 10 1/2 x 5 1/2
Steel Boiler Tubes.....27 1/2 to 10 1/2 x 5 1/2

Planes and Plane Irons—

Molding.....60¢
Bench, First quality.....50¢
Bench, Second quality.....60¢
Bailey's (Stanley R. & L. Co.).....50¢

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50¢
Derby Plane Co.....70¢
Chaplin's Iron Planes.....50¢
Davis Iron Planes.....50¢
Gage Tool Co.'s Self-Setting.....35¢
Miscellaneous Planes (Stanley R. & L. Co.).....25¢
Sargent's.....80¢
Standard Tool Co.....80¢
Stearns Iron Planes.....50¢

Plane Irons—

Abnura Thistle.....30¢
Brook Bros.....30¢
Butcher's.....30¢
Sandusky.....30¢
Stanley R. & L. Co.....30¢
L. & J. White.....30¢

Plates—

Felice.....doz \$6.00

Pliers and Nippers—

Button's Patent.....40¢
Garow's Pat. V. W. Cutters.....20¢
Cronk's 8 in., \$15.00; 10 in., \$20.00
Cronk's Button Pattern.....60¢
Cronk's Carrier Pliers.....40¢
Eureka Pliers and Nippers.....40¢
Gas Pliers.....60¢
Gas Pliers, Constant Nickel Plated.....60¢
Hall's Nippers, No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 doz.....40¢
Hall's Pliers.....70¢
Humason & Beekley Mfg. Co. 50¢
Lindsay's Giant, No. 65, 5 in., doz.....\$10.00
Morrell's Parallels, No. 12, 100.....30¢
P. S. & W. Steel.....50¢
P. S. & W. Timmers' Cutting Nippers, add 4¢.....10¢
Russell's Parallel.....25¢
Wacubury Nip's, 5 in., doz., \$7.50, 33¢

Plumbs and Levels—

Regular list.....75¢
Cook's.....40¢
Davis Inclinoimeters.....10¢
Davis Iron Levels.....50¢
Dialstone's.....70¢
Pocket Levels.....70¢
Stanley's Duplex.....20¢
Stanley's Handy.....20¢

Poachers, Egg—

Buffalo Steam Egg Poachers, doz. No. 1, \$6.00; No. 2, \$9.00.....35¢
Silver & Co. 8-Ring, doz., \$3.00; 5-Ring.....\$1.80

Pokes Animal—

Bishop's American.....doz \$2.50
Bishop's I. X. L.....doz \$5.25
Bishop's Steel Monarch.....doz \$5.25
Bishop's Pioneer.....doz \$5.25
Bolding.....doz \$5.00
Buckeye Single Stale.....doz \$2.50
Columbia, Double Stale.....doz \$5.00
Eagle, Double Stale.....doz \$5.00
Eagle, Single Stale.....doz \$3.25
Metallic Horse Pokes.....doz \$5.00

Police Goods—

Daley's Improved Handcuffs, 2 Hands, Polished, doz. \$48.00; 3 Hands, Polished, doz. \$57.00; 4 Hands, Polished, doz. \$72.00; Nickel, \$84.00.....25¢
J. P. Lovell's Police Goods.....25¢
Newhall Ship Chandlery Co. Handcuffs, \$

Covert, New R. E. 60&10&5&2
 Fitch's (Bristol) 50&10
 Gathman, new list 40&10
 Gathman 10
 Kelley & Woolworth's Steel Harness 50&10
 John Prot's Snaps 75&75&5
 Sargent's Patent Guarded 70&10&10&70&10&10&10

Snaths—

See Snaths 50&2&50&10

Snips, Tinner's—See Shears.**Soldering Irons—**

See Irons, Soldering.

Splittoons, Cuspidors, &c.

Standard Fiberware—
 Cuspidors, 8 1/2-inch, No. 5, 18; No. 10, 30.

Splittoons, Daisy, 8-inch, No. 1, 10 and 11 inch, 30.

Spoke Shaves—

See Shaves, Spoke.

Spoke Trimmers—

See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—
 Basting, Cen. Stamp. Co.'s list, 70&25
 Buffalo, S. S. & Co. 38&42
 Solid Table and Tea, Cen. Stamp. Co.'s list, 70&25

Silver Plated—

4 months or 50 cash 30 days:
 L. Boardman & Son 50&12
 Holmes & Edwards Silver Co. 40, 50&15
 Meriden Brit. Co., Rogers 40&15
 Reed & Barton 40&15
 Rogers & Bros. 40&15
 C. Rogers & Bros. 40&15
 Rogers & Hamilton 40&15
 Wm. Rogers Mfg. Co. 40, 15&25
 Simpson, Hall, Miller & Co. 40, 15&25

Miscellaneous—

Boardman's Britannia Spoons, case lots
 Boardman's Nickel Silver, list July 1, 1891 60&7
 Britannia 60&7
 German Silver 60&7
 Nickel Silver 50&50&10&25 cash
 Holmes & Edwards Silver Co.:
 No. 24 German Silver 50&10&25
 No. 30 Silver Metal 50&10&25
 No. 49 Nickel Silver 50&10&25
 No. 50 Nickel Silver 50&25
 No. 67 Mexican Silver 50&10&25
 Rogers & Hamilton:
 Cimeter, Flatware 40&15&25
 Cimeter, Steel 40&10
 Crown Hamilton Flatware and Cutlery 30
 Steel Goods 40&10
 Wm. Rogers Mfg. Co.:
 18x Rogers' German Silver 60&25
 25x Rogers' Nickel Silver 50&25
 Rogers' Silver Metal 50&10&25

Springs—Door—

Champion (Coll.) 55&10&55&10&25
 Cowell's, No. 1, 10 18.00; No. 2, 15.00
 Gem (Coll.) list April 19, 1886 20
 Hercules 50&50&10
 Phoenix 33&40
 Rubber, complete, 10 18.00; 10 18.00
 Star (Coll.) list April 19, 1886 20&20
 Terrey's Key 30 in 10 18.00; No. 2, 15.00
 Warner's No. 1, 10 18.00; No. 2, 15.00
 Victor (Coll.) 60&10&60&10&25

Carriage, Wagon, &c.—

Multiplo, Concord, Platform and Half
 Roll 60&10&60&10&10&10 or net prices
 Olin's Bolster Springs 25

Sprinklers, Lawn—

Gibbs' Arc 10 18.00; 12.00
 Gibbs' Hustler 10 18.00; 12.00

Squares—

Nickel Plated 35&35&25
 Steel and Iron
 Try Square and T Bevels 60&10&10
 Avery's Bevel Protractor 50
 Avery's Finish Bevel Square 50
 Diston's Try Square and T Bevels 50
 Starrett's Micrometer Caliper Squares 25
 Winterbottom's Try and Miter 30&10

Squeezers—

Blair's 10 18.00; 12.00
 Blair's "Climax" 10 18.00; 12.00

Lemon—

Porcelain Lined, No. 1, 10 18.00; 12.00

Wood, Common 10 18.00; 12.00
 Wood, No. 2 10 18.00; 12.00
 Dean's, No. 1, 10 18.00; 12.00

Dunlap's Improved 10 18.00; 12.00
 Hotchkiss Straight Flash 10 18.00; 12.00
 Jennings' Star 10 18.00; 12.00

King 10 18.00; 12.00
 Little Giant 10 18.00; 12.00
 Sammis, No. 1, 10 18.00; 12.00; No. 2, 10 18.00; 12.00

The Boss 10 18.00; 12.00

Standard Fiber Ware—

See Ware, Standard Fiber.

Staples—

Barbed Blind, 1/2 in. and larger 10 18.00; 12.00
 Barbed Blind, 1/2 in. 10 18.00; 12.00

Fence Staples, Galvanized, Same price
 Fence Staples, Plain, Same price

Grand Crossing Tack Co.'s list 75&10

Steels Butchers—

C. & A. Hoffmann's 40
 Nichols Bros. 50

Steelyards

Blacksmith's 40&10&25

Waterford Goods 35

Sardner 25

Green River 35

Lighting Screw Plate 25&30

Reese's New Screw Plates 25&30

Reversible Ratchet 35

Stone—

Stones, Grind—See Grindstones.

Scythe Stones—
 Pike Mfg. Co., list April, 1892 33&4
 Cleveland Stone Co., list Nov. 18 92 33&4

Oil Stones, &c.—

Pike Mfg. Co.:
 Hindostan No. 1, 10 18.00; 12.00
 Sand Stone 40 10
 Turkey Oil Stone, 4 to 8 in. 40 10
 Turkey Slips 30.00
 Lily White Washita 60
 Rosy Red Washita 60
 Washita Stone, Extra 60
 Washita Stone, No. 1 30
 Washita Stone, No. 2 30
 Lily White Slips 90
 Rosy Red Slips 90
 Washita Slips, Extra 90
 Washita Slips, No. 1 70
 Arkansas Stone, No. 1, 3 to 5 in. 25.00
 Arkansas Stone, No. 15 1/2 to 8 in. 25.00
 Lake Superior 13
 Lake Superior Slips 20
 Tanite Mills:
 Emery Oil 10 18.00; 12.00; 50 65

Stops, Bench—

Cincinnati 25&10
 Crescent 10 18.00; 12.00
 Hotchkiss 10 18.00; 12.00
 McGill's 10 18.00; 12.00
 Miller's Falls 25
 Morrill's 10 18.00; 12.00; No. 2, 11.00
 Stearns 20
 Terrell's Nos. 1 and 2, 10 18.00; 12.00
 Weston's, No. 1, 10.00; No. 2, 10.25; 10.50

Stove Polish—See Polish, Stove**Stretchers Carpet—**

Cast Iron, Steel Points 75&80
 Cast Steel, Polished 10 18.00; 12.00
 Sockets 10 18.00; 12.00
 Bullard's 25&10&40

Strops Razor—

Emerson C. Buff. 10 18.00; 12.00
 Imitation Emerson 10 18.00; 12.00
 Jordan's Pat. Padded, list Nov. 1, 89 50
 Lamont Combination 10 18.00; 12.00

Stuffer Sausage—

Miles Challenge, 10 18.00; 12.00
 Perry 10 18.00; 12.00; No. 1, 21.00
 Draw Out No. 4, each 30.00
 Enterprise Mfg. Co., list Jan. 17, '93 25
 Silver's 40&10

Sweepers, Carpet and**Lawn—**

Acme 10 18.00; 12.00
 Advance 10 18.00; 12.00
 Grand 10 18.00; 12.00
 Gold Medal 10 18.00; 12.00
 Prize 10 18.00; 12.00
 Premier 10 18.00; 12.00
 Superior 10 18.00; 12.00
 Cosmopolitan 10 18.00; 12.00
 Furniture Protector, Jap. 10 18.00; 12.00
 Furniture Protector, Nickel 10 18.00; 12.00
 Inter Ocean 10 18.00; 12.00
 Hall 10 18.00; 12.00
 Crown Jewel, No. 1, 18.00; No. 2, 19.00; No. 3, 20.00
 Domestic, No. 1 10 18.00; 12.00
 Domestic, No. 2 10 18.00; 12.00
 Easy, Jap'd, 10 18.00; 12.00; Nickel, 24.00
 Excelsior 10 18.00; 12.00
 Garland 10 18.00; 12.00
 Gilt Edge 10 18.00; 12.00
 Grand Rapids, Japanned 10 18.00; 12.00
 Grand Rapids, Nickel 10 18.00; 12.00
 Hauswirth's Delight 10 18.00; 12.00
 Improved Parlor Queen 10 18.00; 12.00
 Japanned 10 18.00; 12.00
 Nickel 10 18.00; 12.00
 Ladies' Friend 10 18.00; 12.00
 Ladies' Friend No. 2 10 18.00; 12.00
 Parlor Queen 10 18.00; 12.00
 Standard 10 18.00; 12.00
 Supreme 10 18.00; 12.00
 Bissell Carpet Sweeper Co. make the following rebates:
 1.00 per doz. in 5 doz. lots.
 2.00 per doz. in 10 doz. lots.

Swings—

Davies Lawn 25

Tacks, Brads &c.—

List October 19, 1889. Old established
 straight weights. Short weight goods
 are sold at lower prices.

Carpet Tacks 47 1/2
 American, Blued 47 1/2
 American, Tin'd and Cop'd 52 1/2
 Steel, Bright and Blued 47 1/2
 Steel, Tinned and Coppered 52 1/2
 Swedes Iron, S. S., Blued 40
 Swedes Iron, S. S., Tinned 47 1/2
 American Iron Tacks, Domestic 37 1/2
 American Iron Tacks, Foreign 50
 Swedes Iron Tacks:
 S. S., Blued 37 1/2
 S. S., Tinned 45
 Lanc., Blued 30
 Lanc., Tinned 37 1/2
 Upholsterers', S. S. 47 1/2
 Upholsterers', Lanc. 37 1/2
 Grip Tacks:
 S. S., Blued 30
 S. S., Tinned 42 1/2
 Lanc., Blued 20
 Lanc., Tinned 35
 Basket and Trimmers' Tacks:
 Lanc. 20
 S. S. 30
 Hungarian Nails 35
 Common and Patent Brads 35
 Leathered Tacks 5
 Brush Tacks and Nails, S. S. 20
 Looking Glass Tacks, S. S. 5
 Picture Frame Points, S. S. 12 1/2
 Lace Tacks, Blued 12 1/2
 Lace Tacks, Tinned 20
 Finishing Nails 62 1/2
 Trunk and Clout Nails:
 Black 52 1/2
 Tinned or Coppered 57 1/2
 Basket Nails 37 1/2
 Chair Nails 37 1/2
 Cigar Box Nails 30
 Tin Capped Nails 60
 Shoe Finders' List, Apr. 14, 1894:
 F. H. Cobblers' Nails:
 4 1/2-in and shorter, 100 lb 20.00
 4 1/2-in and longer, 100 lb 18.85
 C. S. Corrugated Brass Nails, or
 Flat Head Improved Brass Nails:
 No. 18 and 19 17 & heavier
 2 & 2 1/2-8 in. 80.00 \$41.20
 3 & 3 1/2-8 in. 51.50 35.15
 4 & 4 1/2-8 in. 41.20 33.45

Miscellaneous—

Double Point 85&10&85&10&10
 Wire Carpet Nails 80&10&80&10&10
 Billye Brad Box 10 18.00; 12.00
 Brandy Blue 10 18.00; 12.00
 Claw Handle Carpet 10 18.00; 12.00
 Home Tacks, No. 50 10 18.00; 12.00
 Home Tacks, No. 100, 10 18.00; 12.00
 Home Tacks, No. 200, 10 18.00; 12.00
 Home Tacks, No. 400, 10 18.00; 12.00
 Home Tacks, No. 800, 10 18.00; 12.00
 Home Tacks, No. 1600, 10 18.00; 12.00
 Home Tacks, No. 3200, 10 18.00; 12.00
 Home Tacks, No. 6400, 10 18.00; 12.00
 Home Tacks, No. 12800, 10 18.00; 12.00
 Home Tacks, No. 25600, 10 18.00; 12.00
 Home Tacks, No. 51200, 10 18.00; 12.00
 Home Tacks, No. 102400, 10 18.00; 12.00
 Home Tacks, No. 204800, 10 18.00; 12.00
 Home Tacks, No. 409600, 10 18.00; 12.00
 Home Tacks, No. 819200, 10 18.00; 12.00
 Home Tacks, No. 1638400, 10 18.00; 12.00
 Home Tacks, No. 3276800, 10 18.00; 12.00
 Home Tacks, No. 6553600, 10 18.00; 12.00
 Home Tacks, No. 13107200, 10 18.00; 12.00
 Home Tacks, No. 26214400, 10 18.00; 12.00
 Home Tacks, No. 52428800, 10 18.00; 12.00
 Home Tacks, No. 104857600, 10 18.00; 12.00
 Home Tacks, No. 209715200, 10 18.00; 12.00
 Home Tacks, No. 419430400, 10 18.00; 12.00
 Home Tacks, No. 838860800, 10 18.00; 12.00
 Home Tacks, No. 1677721600, 10 18.00; 12.00
 Home Tacks, No. 3355443200, 10 18.00; 12.00
 Home Tacks, No. 6710886400, 10 18.00; 12.00
 Home Tacks, No. 13421772800, 10 18.00; 12.00
 Home Tacks, No. 26843545600, 10 18.00; 12.00
 Home Tacks, No. 53687091200, 10 18.00; 12.00
 Home Tacks, No. 107374182400, 10 18.00; 12.00
 Home Tacks, No. 214748364800, 10 18.00; 12.00
 Home Tacks, No. 429496729600, 10 18.00; 12.00
 Home Tacks, No. 858993459200, 10 18.00; 12.00
 Home Tacks, No. 1717986918400, 10 18.00; 12.00
 Home Tacks, No. 3435973836800, 10 18.00; 12.00
 Home Tacks, No. 6871947673600, 10 18.00; 12.00
 Home Tacks, No. 13743895347200, 10 18.00; 12.00
 Home Tacks, No. 27487790694400, 10 18.00; 12.00
 Home Tacks, No. 54975581388800, 10 18.00; 12.00
 Home Tacks, No. 109951162777600, 10 18.00; 12.00
 Home Tacks, No. 219902325555200, 10 18.00; 12.00
 Home Tacks, No. 439804651110400, 10 18.00; 12.00
 Home Tacks, No. 879609302220800, 10 18.00; 12.00
 Home Tacks, No. 1759218604441600, 10 18.00; 12.00
 Home Tacks, No. 3518437208883200, 10 18.00; 12.00
 Home Tacks, No. 7036874417766400, 10 18.00; 12.00
 Home Tacks, No. 14073748835532800, 10 18.00; 12.00
 Home Tacks, No. 28147497671065600, 10 18.00; 12.00
 Home Tacks, No. 56294995342131200, 10 18.00; 12.00
 Home Tacks, No. 112589990684262400, 10 18.00; 12.00
 Home Tacks, No. 225179981368524800, 10 18.00; 12.00
 Home Tacks, No. 450359962737049600, 10 18.00; 12.00
 Home Tacks, No. 900719925474099200, 10 18.00; 12.00
 Home Tacks, No. 1801439850948198400, 10 18.00; 12.00
 Home Tacks, No. 3602879701896396800, 10 18.00; 12.00
 Home Tacks, No. 7205759403792793600, 10 18.00; 12.00
 Home Tacks, No. 14411518807585587200, 10 18.00; 12.00
 Home Tacks, No. 28823037615171174400, 10 18.00; 12.00
 Home Tacks, No. 57646075230342348800, 10 18.00; 12.00
 Home Tacks, No. 115292150460684697600, 10 18.00; 12.00
 Home Tacks, No. 230584300921369395200, 10 18.00; 12.00
 Home Tacks, No. 461168601842738790400, 10 18.00; 12.00
 Home Tacks, No. 922337203685477580800, 10 18.00; 12.00
 Home Tacks, No. 1844674407370955161600, 10 18.00; 12.00
 Home Tacks, No. 3689348814741910323200, 10 18.00; 12.00
 Home Tacks, No. 7378697629483820646400, 10 18.00; 12.00
 Home Tacks, No. 14757395258967641292800, 10 18.00; 12.00
 Home Tacks, No. 29514790517935282585600, 10 18.00; 12.00
 Home Tacks, No. 59029581035870565171200, 10 18.00; 12.00
 Home Tacks, No. 118059162071741130342400, 10 18.00; 12.00
 Home Tacks, No. 236118324143482260684800, 10 18.00; 12.00
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